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Final Report
Assessment of Sediment Quality in Peoria Lake: Results from the Chemical Analysis of Sediment Core Samples Collected in 1998, 1999, and 2000

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Abstract

Informed decisions on the proposed re-use or disposal of dredged sediment require information on the chemical composition of the sediment. This report expands our knowledge of the metal content of Peoria Lake sediments and also includes a comprehensive list of organic parameters. Results are given from a series of ten vibracores that were collected during fall 1998. The results of chemical analyses are also included from two sets of samples collected near River Mile (RM)165 in Peoria Lake. The chemical analyses were performed by the Illinois State Geological Survey (ISGS) and two independent contract laboratories. A limited number of samples were also analyzed by the Waste Management and Research Center (WMRC).

In general, the analytical results for metals and most organic parameters compared well between laboratories. The concentrations of metals and organics in sediments of Peoria Lake were similar to those found in previous studies.

Previous Work

Collinson and Shimp (1972) collected eight sediment samples in Peoria Lake as part of a pilot study. They compared concentrations of trace metals in the sediments from Peoria Lake with those in sediments from southern Lake Michigan and found that the sediments from Peoria Lake contained higher concentrations of lead, zinc, and chromium and lower concentrations of arsenic and bromine. Between 1975 and 1983, Cahill and Steele (1986) collected twenty-seven cores from eighteen backwater lakes, including Peoria Lake, along the length of the Illinois River. They noted that the concentrations of zinc, lead, and cadmium were greater in sediments from the upstream lakes than in those from downstream lakes. The impact of the 1993 flood on sediment quality in several backwater lakes of the lower Illinois River was determined by Demissie et al. (1996). In their study, the sediment samples were analyzed for inorganic composition and pesticides by ISGS and ISWS laboratories. Low concentrations of the pesticide alachlor were detected in fourteen of the seventeen sediment samples tested.

In 1998, Cahill (unpublished) collected fourteen cores, between RM 202 (Senachwine Lake) and RM 164 in Peoria Lake. The study determined the trace metal content in sediments from locations that had previously been studied and expanded coverage to include additional backwater lakes connected to the Illinois River. The locations of sediment cores collected in the Peoria Pool of the Illinois Waterway are shown in figure 1. The gravity cores that were collected averaged about 50 cm in length. The cores were sub-sampled at intervals 0–20 cm, 20–30 cm, 30–40 cm, 40–50 cm, and 50 cm to the base of the core. The sediment samples were analyzed by an Illinois Environmental Protection Agency (IEPA)-approved contract laboratory (Laboratory A) for the total recoverable concentrations of 22 metals. In addition, the samples were analyzed by the ISGS Applied Geochemistry Section for major, minor, and trace elements; estimates of sedimentation rates were made by cesium-137 determination.

Purpose

The purpose of this report is to provide data on the concentrations of a large number of organic and inorganic analytes in sediment cores collected from Peoria Lake. The chemical analyses were conducted at ISGS and at two outside contract laboratories. This report is a compilation of those results. Future reports will provide more detailed interpretation of the results.

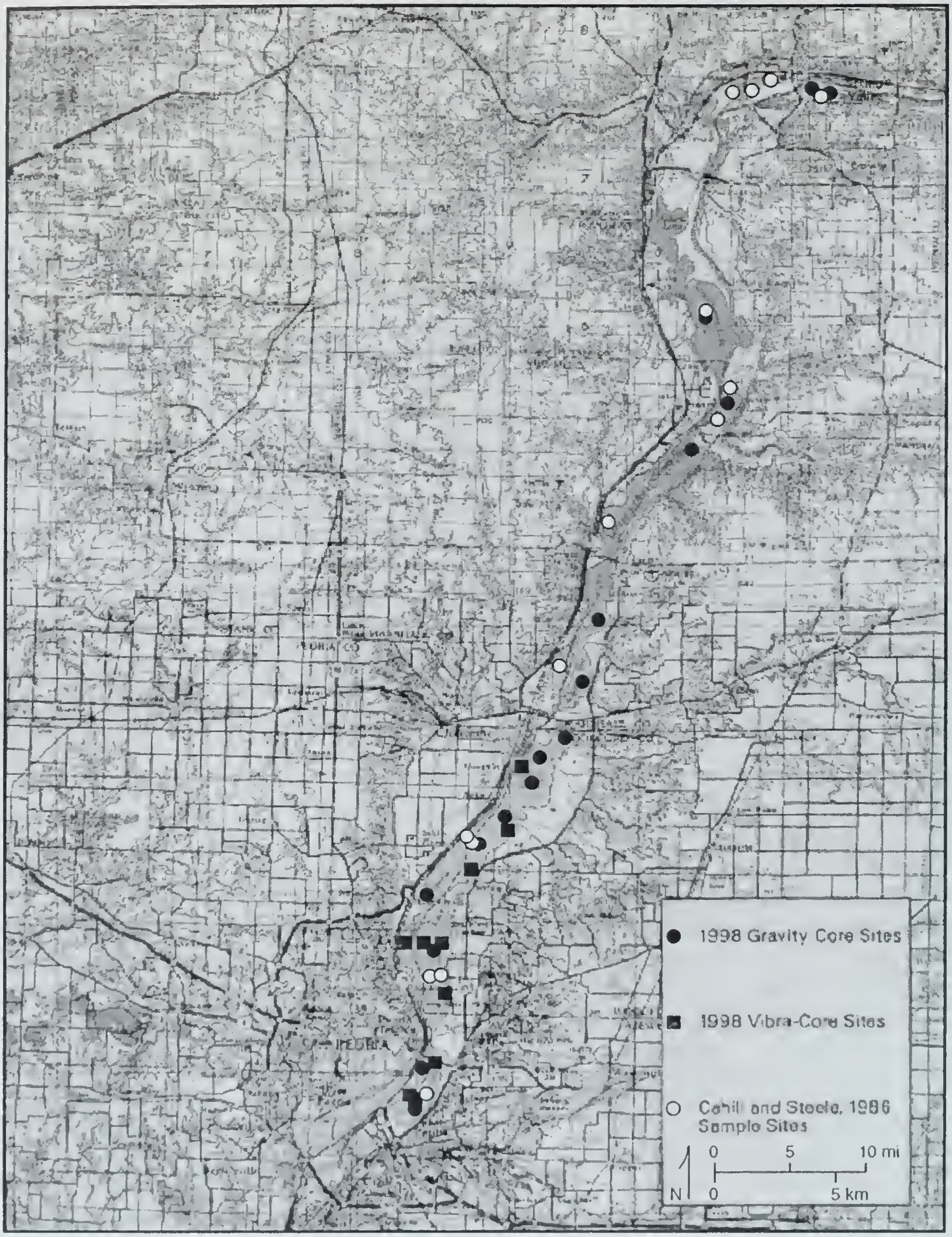


Figure 1 Locations of sediment core collected in 1998 by the ISGS in the Peoria Pool of the Illinois River.

Methods

Choice of Coring Technique

To evaluate the impact of dredging, the cores must be of sufficient length to extend below the proposed 2-m dredging depth. Conventional 5-cm diameter gravity coring devices were not able to collect more than 0.8 m of sediment, even when using a 1.5-m core tube (Cahill and Bogner, unpublished). In previous work, Cahill and Steele (1986) found that a 7.5-cm diameter gravity corer could collect cores of up to 1.3 m in length. For the present work, a portable vibracoring system was used that had collected cores up to 5-m long in sediment in the Grand Calumet River (Cahill and Unger 1993).

Location of Peoria Lake Sediment Cores

This study was limited to Peoria Lake. Sample locations were chosen based on previous studies (Cahill and Steele 1986). Figure 2 shows the locations of the cores collected during November 24 through December 1, 1998. The locations of the coring sites were determined using a portable GPS system. The core identification number, date of collection, approximate river mile, detailed location, and the length of the core recovered are given in table 1.

Two additional sets of sediment samples were collected in Peoria Lake as part of sediment quality studies sponsored by the Illinois Department of Natural Resources. Three sediment cores, approximately 1 m in length were collected in February 1999 near the entrance of Spindler Marina at RM 165. Five more sediment cores, approximately 0.4 m in length were collected in October 2000 near RM 165.

Collection and Initial Preparation of Vibracore Sediment Samples

Sediment samples collected using the portable vibracoring system were collected in aluminum pipe to avoid organic contamination. After being retrieved, the core tubes were capped, sealed with duct tape, and labeled in the field. The cores were extruded from the aluminum sample tubes in the laboratory, split lengthwise, and described. One-half of each core was stored for later detailed analysis and for cesium-137 dating at the ISGS. The other half of each core was sub-sampled in large composite samples and analyzed for a comprehensive list of analytes and physical parameters at ISGS.

Up to three samples were taken from each core; each composite ranged from 0.6 to 1 m in length. Large composites were necessary because of the number of parameters that were determined and the number of laboratories involved. A total of twenty sediment samples were prepared for analysis. Analytical splits of the sediment samples were sent to an IEPA-approved contract laboratory (Laboratory A) for analysis.

Methods of Analysis and the Analytes Determined by the ISGS

The twenty large composite sediment samples were analyzed by procedures at the ISGS that are considered to result in total metal concentrations. The procedures used were the same as those used in previous studies on the Illinois River (Cahill and Steele 1986, Demissie et al. 1996). The techniques used and the elements determined were as follows:

- x-ray fluorescence spectrometry (XRF): silicon, aluminum, iron, calcium, magnesium, potassium, sodium, titanium, phosphorous, sulfur, barium, strontium, and zirconium
- atomic absorption spectrometry (AAS): cadmium, copper, nickel, lead, and zinc
- energy-dispersive x-ray fluorescence spectrometry (EDX): barium, molybdenum, tin, strontium, and zirconium
- coulometric method: total carbon, inorganic carbon, and organic carbon (by difference) gravimetric method: loss on ignition

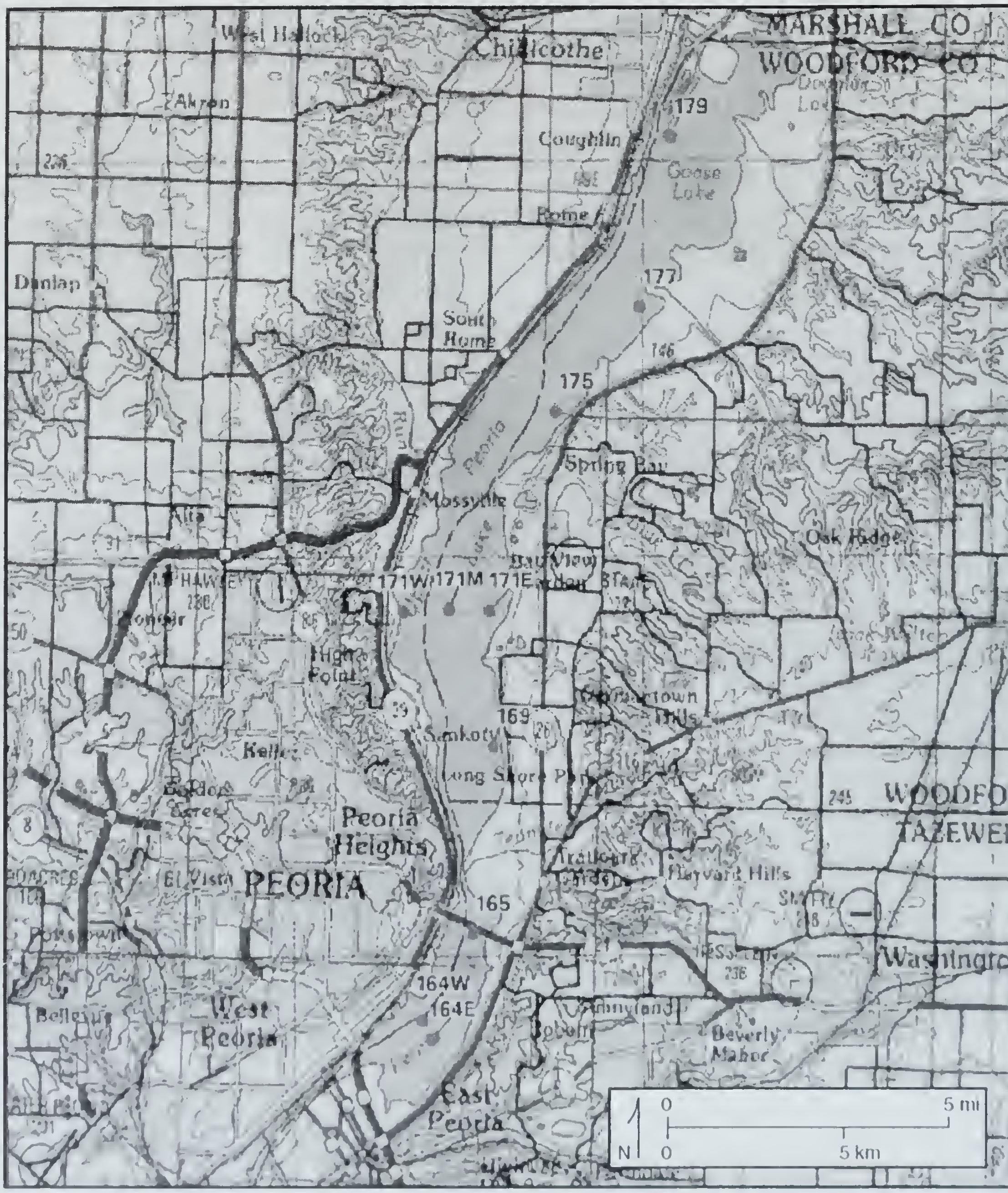


Figure 2 1998 vibracore locations in Peoria Lake used for sediment quality analyses and sedimentation rate estimates.

Table 1 Core identification, date collected, approximate river mile, latitude, longitude, and core length of vibracores collected in Peoria Lake for this study.

Core ID	Date collected	Approximate RM	Latitude	Longitude	Core length (cm)
179	12/01/98	179	40°E53′N21.5″N	89°E29′N24.5″W	164
177	12/01/98	177	40°E51′N37.6″N	89°E29′N58.0″W	172
175	12/01/98	175	40°E50′N27.3″N	89°E31′N01.4″W	151
171 W	11/28/98	171	40°E57′N30.8″N	89°E33′N59.6″W	187
171 M	11/28/98	171	40°E47′N29.9″N	89°E33′N02.8″W	114
171 E	11/28/98	171	40°E47′N29.9″N	89°E32′N30.4″W	122
169	11/24/98	169	40°E46′N27.8″N	89°E33′N03.4″W	204
165.5	11/28/98	165.5	40°E42′N29.8″N	89°E32′N29.8″W	94
164 E	11/28/98	164	40°E41′N29.9″N	89°E33′N18.4″W	237
164 W	11/28/98	164	40°E41′N50.2″N	89°E33′N30.7″W	254

Metals were also determined by the ISGS with inductively coupled plasma emission spectrometry (ICP) according to U.S. EPA Method 6010. This method is not a total digestion procedure, but results in "total recoverable metal concentrations" for the following: aluminum, arsenic, boron, barium, beryllium, calcium, cadmium, cobalt, chromium, copper, iron, potassium, lanthanum, lithium, magnesium, manganese, molybdenum, sodium, nickel, lead, sulfur, antimony, scandium, selenium, silicon, strontium, titanium, thallium, vanadium, and zinc.

Methods of Analysis and the Analytes Determined by Laboratory A

Moisture was determined by ASTM Method D2216. Bulk density was determined according to U.S. EPA Method 2710F. Chemical oxygen demand was determined according to U.S. EPA Method 410.4. Arsenic, barium, cadmium, chromium, lead, and silver were determined by ICP according to U.S. EPA Method 6010. Mercury was determined by cold vapor AAS according to U.S. EPA Method 7471. Selenium was determined by AAS according to U.S. EPA Method 7740. Ammonia nitrogen was determined according to U.S. EPA Method 350.3. Total Kjeldahl nitrogen was determined according to U.S. EPA Method 351.4. Cyanide was determined according to U.S. EPA Method 9010. Total phosphorus was determined according to U.S. EPA Method 365.2. Reactive sulfide was determined according to U.S. EPA Method 7.3.4.1

The volatile organic compounds that were determined were acetone, benzene, bromodichloromethane, bromoform, 2-butanone, carbon disulfide, carbon tetrachloride, chlorobenzene, chloroethane, chloroform, dibromochloromethane, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, *cis*-1,2-dichloroethene, *trans*-1,2-dichloroethene, 1,2-dichloropropane, *cis*-1,3-dichloropropene, *trans*-1,3-dichloropropene, ethyl benzene, 2-hexanone, methyl chloride, methyl bromide, 4-methyl-2-pentanone, methylene chloride, styrene, 1,1,2,2-tetrachloroethane, tetrachloroethene, toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene, vinyl chloride, and xylenes (total). These compounds were determined by gas chromatography-mass spectroscopy according to U.S. EPA Method 8260.

The polychlorinated biphenyl (PCB) mixtures that were determined were Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, and Aroclor-1260. These compounds were determined by gas chromatography according to U.S. EPA Method 8082.

The pesticides determined were aldrin, γ-BHC (Lindane), α-BHC (α-benzene hexachloride), 4,4′-DDD (4,4′-dichlorodiphenyldichloroethane), β-BHC, δ-BHC, chlordane (α), chlordane (γ), 4,4′-DDE (4,4′-dichlorodiphenyldichloroethylene), 4,4′-DDT (4,4′-dichlorodiphenyltrichloroethane), dieldrin, endosulfan I, endosulfan II, endosulfan sulfate, endrin, endrin aldehyde, endrin ketone, heptachlor, heptachlor epoxide, methoxychlor, and toxaphene. These compounds were determined by gas chromatography according to U.S. EPA Method 8081.

The chlorinated herbicides determined were 2,4-D, 2,4-DB, dalapon, dicamba, dichloroprop, dinoseb, MCPP (propanoic acid; 2-(4-chloro-2-methylphenoxy)-), MCPA (acetic acid; (4-chloro-2-methylphenoxy)-), pentachlorophenol, picloram, 2,4,5-T, 2,4,5-TP (silvex). These compounds were determined by gas chromatography according to U.S. EPA Method 8151.

The following polycyclic aromatic hydrocarbons (PAH) were determined: acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h) anthracene, fluoranthene, fluorene, indeno (1,2,3-c,d) pyrene, naphthalene, phenanthrene, and pyrene. These compounds were determined by gas chromatography-mass spectroscopy according to U.S. EPA Method 8270, and high pressure liquid chromatography according to U.S. EPA Method 8310.

Sediment Quality Results

In the summary tables that follow, values reported as less than the detection limit were assigned the value of one-half the detection limit for statistical analyses when at least 50% of the values had detectable concentrations. Variations in detection limits by method and laboratories must also be considered when interpreting the results.

Results of the Analysis of Large Composite Sediment Samples Taken from Vibracores Collected in Peoria Lake in 1998

The results for total metal analysis of the twenty large composite samples from Peoria Lake are given in Appendix 1. A summary of the means and standard deviations, minimum and maximum concentrations, and number of values above the detection limit for total metal concentrations in sediments from Peoria Lake determined by the ISGS is provided in table 2.

The results for total recoverable metals in the twenty large composite samples from Peoria Lake are given in Appendix 2. A summary of the means and standard deviations, minimum and maximum concentrations, and number of values above the detection limit for total recoverable metal concentrations in sediments from Peoria Lake determined by ICP at ISGS is provided in table 3.

The results from Laboratory A for the comprehensive list of parameters are presented in Appendix 3. A summary of the means and standard deviations, minimum and maximum concentrations, and number of values above the detection limit for the metal concentrations and physical parameters in sediments from Peoria Lake determined by Laboratory A is provided in table 4. Most of the concentrations of the thirty-four volatile organic compounds were below the method detection limit. Acetone, 2-butanone, and methylene chloride were detected in some of the samples tested.

Table 2 Means and standard deviations, minimum and maximum concentrations, and number of values above the detection limit of total metal concentrations in sediments from Peoria Lake determined by various techniques at the ISGS. All values are milligrams per kilogram unless noted otherwise.

Metal and method	No.	Mean	Std. Dev.	Minimum	Maximum
Total carbon (%)	20	4.17	1.46	2.58	9.20
Inorganic carbon (%)	20	1.31	0.87	0.29	4.02
Organic carbon (%)	20	2.86	0.96	1.33	5.88
SiO_2 (%) (XRF)	20	56.52	5.83	38.80	65.70
Al_2O_3 (%) (XRF)	20	12.67	2.01	7.40	15.50
Fe_2O_3 (%) (XRF)	20	5.20	0.91	2.68	6.41
CaO (%) (XRF)	20	5.10	3.50	1.89	15.32
MgO (%) (XRF)	20	2.74	0.44	1.96	4.17
K_2O (%) (XRF)	20	2.75	0.32	1.93	3.29
Na_2O (%) (XRF)	20	0.59	0.09	0.36	0.77
TiO_2 (%) (XRF)	20	0.66	0.09	0.43	0.73
P_2O_5 (%) (XRF)	20	0.35	0.12	0.11	0.59
MnO (XRF)	20	870	200	500	1,200
SO_3 (%) (XRF)	20	0.41	0.10	0.27	0.77
Ba (XRF)	20	488	55	336	562
Ba (EDX)	20	556	62	320	609
Cd (AAS)	11	2.3	2.4	<0.9	9.6
Cu (AAS)	20	56	17	19	92
Mo (EDX)	20	20	4	12	29
Ni (AAS)	12	37	29	<20	96
Pb (AAS)	19	95	30	49	180
Sn (EDX)	16	6	2	<5	9
Sr (XRF)	20	126	13	105	159
Sr (EDX)	20	105	12	88	132
Zn (AAS)	20	310	126	51	591
Zr (XRF)	20	132	32	67	210
Zr (EDX)	20	215	33	128	264

No PCB compounds or pesticides were detected. Of the twelve chlorinated herbicides evaluated, 2,4-D was detected in four samples, dalapon in five samples, and dicamba in one sample.

Laboratory A used two techniques to measure the concentrations of sixteen polycyclic aromatic hydrocarbons (PAH) compounds. A summary of the means and standard deviations, minimum and maximum concentrations, and number of values above the detection limit of PAH compounds in sediments from Peoria Lake determined by Laboratory A is provided in table 5. The ranges for the detected concentrations of PAH compounds are generally large.

Table 3 Means and standard deviation, minimum and maximum concentrations, and number of values above the detection limit of total recoverable metal concentrations in sediments from Peoria Lake determined by ICP at ISGS. All values are milligrams per kilogram unless noted otherwise.

	No.	Mean	Std. Dev.	Minimum	Maximum
Si	20	213	57	140	361
Al (%)	20	3.53	0.81	1.17	4.58
Fe (%)	20	3.41	0.73	1.66	4.28
Ca (%)	20	3.53	2.55	1.24	10.90
Mg (%)	20	1.48	0.28	0.98	2.43
K (%)	20	0.72	0.16	0.27	0.97
Na	20	431	154	160	770
Ti	20	402	78	188	483
Mn	20	628	135	339	884
S	20	1,426	529	818	3,200
As	0	<50		<50	
B	20	56	9	32	68
Be	20	1.2	0.3	0.5	1.7
Ba	20	211	42	97	275
Cd	11	5.5	2.8	<5	13
Co	20	14	2.9	7	19
Cr	20	59	23	11	105
Cu	20	48	17	13	86
La	20	24	4	14	27
Li	20	36	8	16	45
Mo	0	<10		<10	
Ni	20	62	43	17	199
Pb	17	51	20	<20	88
Sb	2	<25		<25	28
Sc	20	7	1	3	9
Se	0	<50		<50	
Sr	20	59	18	38	114
Tl	0	<100		<100	
V	20	35	9	12	51
Zn	20	303	120	49	571

Table 4 Means and standard deviations, minimum and maximum concentrations, and number of values above the detection limit for physical parameters and inorganics in sediments from Peoria Lake determined by Laboratory A. All values are milligrams per kilogram unless noted otherwise.

	No.	Mean	Std. Dev.	Minimum	Maximum
Sand (%)[1]	19	6.1	10.3	1.0	44.0
Silt (%)[1]	19	39.6	7.3	26.0	56.0
Clay (%)[1]	19	54.3	12.0	19.0	72.0
Bulk density (g/m^3)	20	1.5	0.1	1.4	1.7
COD (mg/L)	20	242	202	31	713
As	18	26	11	<8	43
Ag	0	<2.3		<2.6	
Ba	20	145	31	81	211
Cd	18	4.0	2.7	<0.8	11.6
Cr	20	51	23	9	99
Pb	19	56	25	<8	99
Hg	19	0.34	0.18	<0.03	0.72
Se	16	1.3	0.5	<1	2.1
NH_4 N	20	94	34	30	151
TKN[2]	20	1,138	889	117	3,020
Total P	20	1,003	272	574	1,660
Reactive sulfide	20	85	35	39	178

[1]Due to insufficient sample volume, no grain size results were available for one sample.

[2]Total Kjeldahl N.

The PAH compounds are produced from the incomplete combustion of fossil fuels. Potential sources include diesel and gasoline engines, incinerators, power plants, and industrial processes.

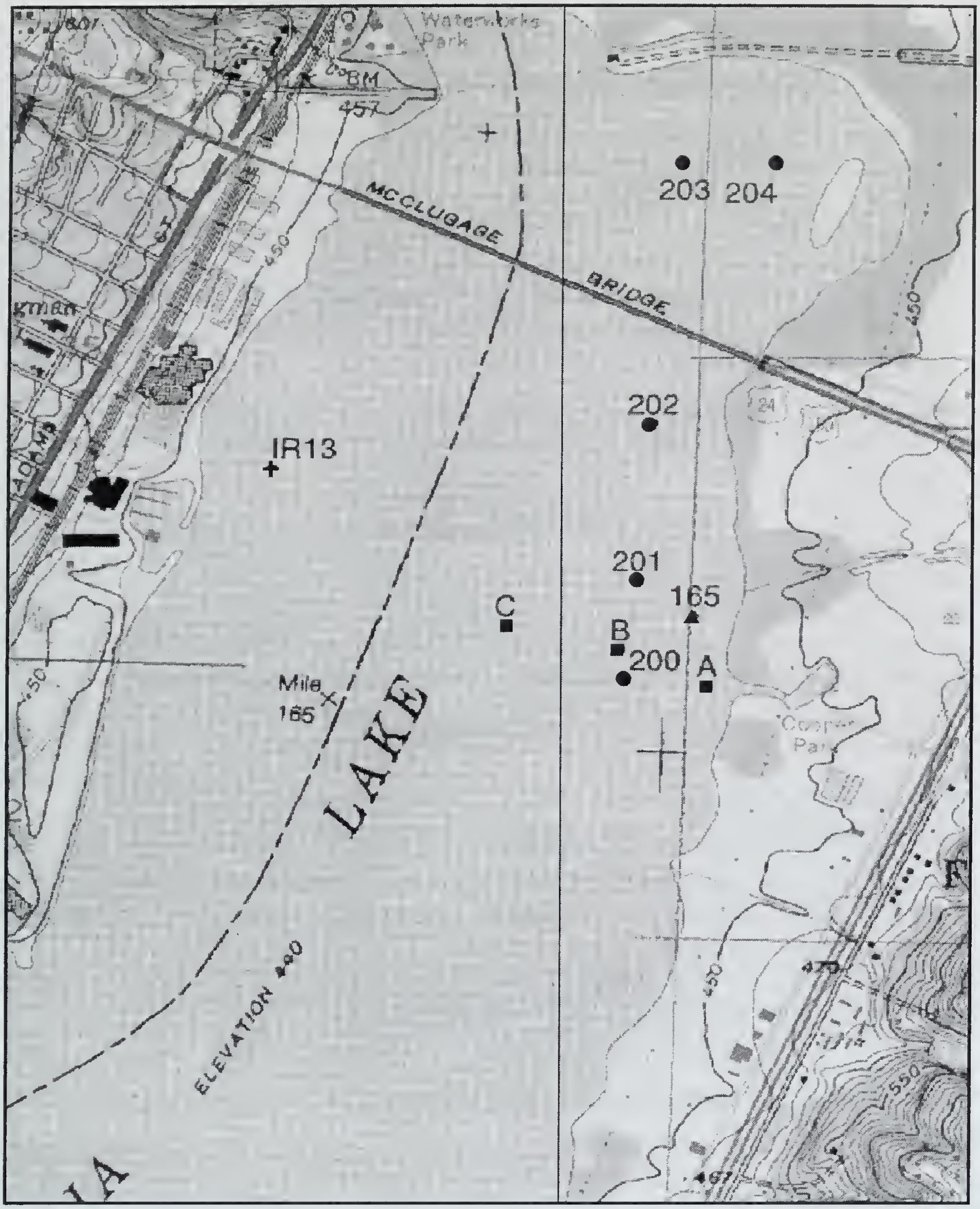
Results from Peoria Lake Sediment Samples Collected near RM 165 in February 1999

Three sediment cores were collected near Carl Spindler Marina, RM 165, in February 1999 by Laboratory A. The core samples were collected approximately 175 m (A), 450 m (B), and 725 m (C) from the entrance to the marina using a conventional gravity corer. The locations of the samples are shown in figure 3. The cores were approximately 1 m in length, and each core was composited into a single analytical sample. The sediment samples were analyzed by Laboratory A, and the results are given in Appendix 4.

Metal concentrations were similar to those in the vibracore samples. Acetone was the only volatile organic compound detected. No PCB compounds or pesticides were detected. MCPP was the only chlorinated herbicide detected. Concentrations of PAH compound were similar to those in the vibracore samples.

Table 5 Means and standard deviations, minimum and maximum concentrations, and number of values above the detection limit for PAHs in sediments from Peoria Lake determined by two U.S. EPA methods by Laboratory A. All values are micrograms per kilogram.

	Method	No.	Mean	Std. Dev.	Minimum	Maximum
Acenaphthene	8310	10	943	885	<1,200	3,500
	8270	0	<420		<420	
Acenaphthylene	8310	0	<1,300		<1,300	
	8270	1	<400		<400	270
Anthracene	8310	10	126	101	<130	420
	8270	1	<420		<420	440
Benzo(a)anthracene	8310	8	<420		<420	3,100
	8270	10	383	322	<370	1,200
Benzo(a)pyrene	8310	17	642	600	<130	2,200
	8270	13	592	449	<390	1,700
Benzo(b)fluoranthene	8310	20	3,060	1,278	260	5,800
	8270	12	511	352	<390	1,300
Benzo(g,h,i)perylene	8310	9	<130		<130	1,500
	8270	2	<420		<420	550
Benzo(k)fluoranthene	8310	17	252	179	<130	690
	8270	10	369	261	<340	1,200
Chrysene	8310	16	830	997	<130	3,500
	8270	13	534	389	<390	1,400
Dibenz(a,h)anthracene	8310	7	<120		<120	2,800
	8270	0	<400		<400	
Fluoranthene	8310	18	894	902	<6	3,800
	8270	12	526	430	<390	1,600
Fluorene	8310	0	<1,200		<1,200	
	8270	0	<420		<420	
Indeno(1,2,3-c,d)pyrene	8310	13	428	433	<100	1,200
	8270	2	<370		<370	500
Naphthalene	8310	0	<1,100		<1,100	
	8270	0	<370		<370	
Phenanthrene	8310	17	307	311	<130	1,400
	8270	3	<420		<420	900
Pyrene	8310	12	911	1043	<130	3,500
	8270	14	670	511	<390	2,100



+ = 4/1998 Gravity Core (ISGS and Lab A); ▲ = 11/1998 Vibra-Core (ISGS and Lab A);
■ = 2/1998 Gravity Cores (Lab A); ● = 10/2000 Gravity Cores (Lab B)

Figure 3 Locations where sediment cores were collected in Peoria Lake near RM 165 between 1998 and 2000.

Results from Peoria Lake Sediment Samples Collected near RM 165 in October 2000

Five sediment cores were collected in Peoria Lake on October 11, 2000 using a conventional gravity corer. The locations of the sediment cores and the lengths of the cores recovered are listed in table 6 and shown in figure 3. Each sediment core was split into two segments. One 5-cm segment of the core was sampled for volatile organic carbon compounds. Approximately the bottom 10 cm of each core were composited and tested for a comprehensive list of metals, pesticides, semi-volatile organic compounds, PAH compounds, PCBs, and chlorinated herbicides. The analysis was done by a second contract laboratory (Laboratory B). The results are given in Appendix 5.

No volatile organic compounds, semi-volatile compounds, PCBs, pesticides, or chlorinated pesticides were detected; PAH compounds were detected at lower concentrations than those reported by Laboratory A.

Quality Control/Quality Assurance Data

The quality control data reports from Laboratories A and B are available on request. In general, results were within limits specified for recovery of spiked analytes, analysis of surrogate compounds, and for method blanks. No blind duplicates or reference sediment samples were submitted to Laboratory A or B as an independent check of accuracy or precision of the results.

Discussion

Comparison of Arsenic Results for Eight Peoria Lake Sediment Samples Analyzed by WMRC and Laboratory A

The results for arsenic determined by Laboratory A were elevated compared with previous work done at ISGS and at Laboratory A. Splits of the eight samples analyzed by Laboratory A were submitted to WMRC for determination of arsenic. The results are listed in table 7. The results from the WMRC are in better agreement with previous results by the ISGS for concentrations of arsenic in Peoria Lake sediments (Cahill and Steele 1986).

Table 6 Location of sediment samples collected October 11, 2000 in Peoria Lake for comprehensive analysis by Laboratory B.

Core ID	Approximate RM	Latitude	Longitude	Core length (cm)
200	165.2	40°42′37.5″N	89°32′45.7″W	35
201	165.4	40°42′46.0″N	89°32′34.6″W	40
202	165.6	40°42′52.6″N	89°32′37.1″W	40
203	165.8	40°43′20.6″N	89°32′32.6″W	52
204	165.9	40°43′21.5″N	89°32′35.8″W	57

Table 7 Comparison of results for arsenic in Peoria Lake sediment by WMRC and Laboratory A on splits of eight samples.

Analysis number	Core ID	Depth interval (cm)	WMRC (mg/kg)	Lab A (mg/kg)
R21555	175	0–75	16	43
R21545	171 E	0–60	11	32
R21547	171 W	0–100	11	30
R21548	171 W	100–190	15	34
R21549	164 E	0–100	15	34
R21552	164 W	0–100	15	39
R21553	164 W	100–175	12	37
R21554	164 W	175–254	11	32

Comparison of PAH Results for Six Peoria Lake Samples Analyzed by ISGS, WMRC, and Laboratory A

The results for PAH compounds determined by Laboratory A were evaluated by analysis of six splits of the same sediment samples at ISGS and WMRC. The results are listed in table 8. The results from Laboratory A contained a significant number of "less than" values and seemed to be biased toward large values.

Comparison of Metals Results for Peoria Lake Sediment Samples Collected Near RM 165 during Three Years Analyzed by ISGS and Laboratories A and B

There is considerable interest in the sediment quality near RM 165 in Peoria Lake. Dredging took place there during summer 2000 to maintain access to Spindler Marina. This area in the lake is also where large-scale dredging projects have been proposed. Sediment samples were collected in 1999 and 2000 to evaluate sediment quality. The sediment samples were analyzed by a variety of techniques and by two contract laboratories.

The concentrations of metals and major elements in sediment samples collected near RM 165 in Peoria Lake between 1998 and 2000 are listed in table 9. Included are the results from a core (IR13) that was collected on the west side of the navigation channel in April 1998 and analyzed by ISGS and Laboratory A.

The concentrations of PAH, PCBs, and detected chlorinated pesticides in sediment samples in cores collected near RM 165 in Peoria Lake and analyzed by Laboratories A and B are provided in table 10. Laboratory B found much lower concentrations of PAH compounds than did Laboratory A. PCBs were not detected by either laboratory. The chlorinated pesticide MCPP detected by Laboratory A was not observed by Laboratory B.

Table 8 Comparison of results for the gas chromatographic-mass spectroscopic analysis (EPA Method 8270) of PAH in six Peoria Lake sediment samples by ISGS, WMRC, and Laboratory A. All results are micrograms per kilogram.

	ISGS 164 E	WMRC 0–100	Lab A	ISGS 164 W	WMRC 175–254	Lab A
Acenaphthene	0.2		<390	1		<330
Acenaphthylene	30		<390	34		<330
Anthracene	49	55	<390	38		<330
Benzo(a)anthracene	156		<390	136		<330
Benzo(a)pyrene	140		<390	282		400
Benzo(b)fluoranthene	102		<390	88		480
Benzo(g,h,i)perylene	48		<390	49		<330
Benzo(k)fluoranthene	65		<390	77		410
Chrysene	88	125	<390	92	167	470
Dibenz(a,h)anthracene	18		<390	16		<330
Fluoranthene	180	200	<390	153	231	410
Fluorene	7		<390	5		<330
Indeno(1,2,3-c,d)pyrene	53		<390	59		<330
Naphthalene	43		<390	48		<330
Phenanthrene	114	178	<390	119	189	<330
Pyrene	199	260	<390	203	320	610

	ISGS 169	WMRC 0–100	Lab A	ISGS 171 W	WMRC 175–254	Lab A
Acenaphthene	0.2		<370	1		<350
Acenaphthylene	33		<370	69		<350
Anthracene	30	127	<370	60	91	<350
Benzo(a)anthracene	155		<370	281		370
Benzo(a)pyrene	310		1,000	394		550
Benzo(b)fluoranthene	91		<370	142		650
Benzo(g,h,i)perylene	48		<370	1		<350
Benzo(k)fluoranthene	78		<370	143		580

	ISGS 164 E	WMRC 0–100	Lab A	ISGS 164 W	WMRC 175–254	Lab A
Chrysene	103	250	<370	6	167	520
Dibenz(a,h)anthracene	16		<370	4		<350
Fluoranthene	169	262	<370	9	277	500
Fluorene	6		<370	13		<350
Indeno(1,2,3-c,d)pyrene	56		<370	1		<350
Naphthalene	<1		<370	64		<350
Phenanthrene	95	300	<370	110	267	<350
Pyrene	245	380	<370	427	380	770

	ISGS 175	WMRC 0–75	Lab A	ISGS 177	WMRC 0–100	Lab A
Acenaphthene	0.3		<320	1		<340
Acenaphthylene	103		<320	310		<340
Anthracene	76	91	<320	149	55	<340
Benzo(a)anthracene	268		640	580		410
Benzo(a)pyrene	398		630	306		540
Benzo(b)fluoranthene	2		690	421		610
Benzo(g,h,i)perylene	1		<320	223		<340
Benzo(k)fluoranthene	196		480	408		<340
Chrysene	9	292	900	565		580
Dibenz(a,h)anthracene	7		<320	19		<340
Fluoranthene	10	431	970	16	246	600
Fluorene	15		<320	45		<340
Indeno(1,2,3-c,d)pyrene	103		<320	253		<340
Naphthalene	123		<320	106		<340
Phenanthrene	221	256	<320	308	217	<340
Pyrene	512	540	1,200	788	300	750

Table 9 Concentrations of major constituents and metals in Peoria Lake sediment collected near RM 165 determined by IS and Laboratories A and B. ISGS 1, total metal concentrations; ISGS 2, total recoverable metal concentrations; n, numb of sub-samples used to calculate the mean concentration; CL, core length. All values are milligrams per kilogram un noted otherwise.

	ISGS 1 4/98 CL0.5 m n = 4	Lab A 4/98 n = 4	ISGS 1 11/98 CL0.9 m n = 1	ISGS 2 11/98 n = 1	Lab A 11/98 n = 1	Lab A 2/99 CL1.0 m n = 3	Lab E 10/00 CL0. n = 5
NH_4N					30	577	335
TKN					533	614	2,622
Total P	800		1,000		937		989
Org. C (%)	2.63		2.17				0
Al (%)	6.96	1.29	6.40	3.43			1
Fe (%)	3.76	2.42	3.54	3.46			1
Ca (%)	3.30	2.77	3.28	3.14			2
Mg (%)	1.72	1.21	1.70	1.56			1
K (%)	2.32	0.19	2.34	0.74			0
Na	4,400	464	4,900	210			260
Mn	696	611	770	721			419
Ag	1.6				<2	<2	<2
As	13	8.4		<50	26	7.7	5
Be				1.1			0
Ba	482	224	470	190	106	128	82
Cd	<3	4.1	<0.9	<5	1.7	4.4	<2
Co	18	10		14			7
Cr	123	52		43	32	48	32
Cu	58	62	36	31			27
Hg	0.27	0.27			0.12	0.33	0
Ni	40	45	<20	48			30
Pb	121	60	73	25	32	52	52
Sb	1.4			<25			<10
Sc	1.6			<50		<1	<1
Tl		<50		<100			<1
V		25		35			21
Zn	320	337	176	173			184

Table 10 Concentrations of PAH (Method 8310), PCBs, and chlorinated pesticides in Peoria Lake sediment collected near RM 165 determined by Laboratories A and B. All values are micrograms per kilogram.

	Lab A 11/98	Lab A 2/99	Lab B 10/00
Acenaphthene	<940	423	51
Acenaphthylene	<940	<76	<180
Anthracene	<94	53	10
Benzo(a)anthracene	310	195	<75
Benzo(a)pyrene	240	385	25
Benzo(b)fluoranthene	3,100	2,050	16
Benzo(g,h,i)perylene	<6	680	36
Benzo(k)fluoranthene	130	210	24
Chrysene	120	250	18
Dibenz(a,h)anthracene	<94	2,800	6
Fluoranthene	360	325	33
Fluorene	<940	93	<25
Indeno(1,2,3-c,d)pyrene	<94	526	19
Naphthalene	<93	257	<200
Phenanthrene	120	195	11
Pyrene	<94	520	26
PCBs	<630	<74	<64
2-4D	<190	<230	<40
Dalapon	<190	<230	<200
Dicamba	<96	<120	<10
MCPP	<3,800	14,000	<5,000

Comparison of Peoria Lake Sediment Quality to Background Soils, IEPA Classification of Lake Sediments, U.S. EPA Sediment Screening Values, and IEPA "TACO" Values

The ISGS has measured the background concentrations of 48 inorganic elements in 192 soil samples from 77 counties in Illinois (Frost 1995). Included in that study were eighteen soil samples collected in seven of the counties that border the Peoria Pool of the Illinois River. The soil samples were collected at depths of 10 to 20 cm and 70 to 80 cm.

The IEPA determined the background concentrations of inorganic elements in 775 background soil samples from all 102 counties of Illinois (IEPA 1994). The soils were collected at various depths using different sampling techniques at sites judged by the field staff to be undisturbed by site-related activities. In the IEPA study, values reported as less than the detection limit

Table 11 Range in and mean background (Bkg.) concentrations of metals in undisturbed soils in the Peoria area, mean mean concentrations in Illinois soils determined by ISGS and IEPA, and elevated and highly elevated IEPA classifications of metals in Illinois lake sediments. All values are milligram per kilogram.

	Bkg. for soils in Peoria area ISGS	Bkg. for soils statewide ISGS	Bkg. For soils statewide IEPA	IEPA elevated sediment concentrations	IEPA highly elevated sediment concentrations
TKN				5,357–11,700	>11,700
P	200–1,200	500		1,125–2,179	>2,179
Sb	0.8–17	1.1			
As	7–21	10	7	14–95	>95
Ba	210–810	545	130	271–397	<397
Be	0.5–1.9	1.4	0.7		
B	30–64	46			
Cd	<3	<1	1	5–14	>14
Cr	40–91	57	17	27–49	>49
Co	5–21	11	9		
Cu	15–51	30	20	100–590	>590
Pb	10–40	24	49	59–339	>339
Mn	186–2,170	600	767	1,700–5,500	>5,500
Hg			0.11	0.15–0.70	>0.70
Ni	<16–53	24	17	31–43	>43
Sc	<1–13	<1	0.5		
Ag	<1		0.8	0.1–1	>1
Tl	< 1–3	1.4	0.6		
V	37–260	92	25		
Zn	35–145	73	103	145–1,100	>1,100

Table 12 Number of observations and mean, maximum, and minimum sediment chemistry results used to classify the lower Illinois-Senachwine Lake watershed by the U.S. EPA. All values are milligrams per kilogram unless noted.

	No.	Mean	Maximum	Minimum
As	21	8.3	18	1
Cd[1]	21	10	53	2
Cr	21	40	56	15
Cu	21	79	324	13
Dieldrin (µg/kg)	18	2	9	2
DDT (µg/kg)	90	0.4	13	1.4
Pb	21	57	160	5
Hg (µg/kg)	20	398	1,784	46
Ni	14	29	42	16
PCB (µg/kg)	18	21	55	14
Zn[1]	21	4,471	40,870	44

[1] These results include samples from Lake DePue that contain elevated concentrations of cadmium and zinc (Cahill and Steele 1986, Cahill and Bogner, unpublished).

were included in the statistics as one-half the detection limit. The analytical method used was not a total digestion procedure, so their results are not directly comparable with those of ISGS.

The IEPA has classified Illinois lake sediment quality based on the analysis of 1,876 sediment samples that have been collected from 307 lakes in Illinois since 1977. Lake sediments were considered to have elevated concentrations of an analyte if the concentration was between one and two standard deviations above the analyte mean. Sediments were considered to have highly elevated concentrations if the concentration was greater than two standard deviations above the mean. In this statistical treatment of the data, all values below detection were converted to zero. This classification was not intended to be a standard, but as a way to compare and classify lake sediments (Mitzelfelt 1996).

The ranges of background concentrations of metals in undisturbed soils in the Peoria area, background concentrations of metals in Illinois soils determined by ISGS and IEPA, and concentrations classified as elevated and highly elevated for Illinois lake sediments by the IEPA are listed in table 11.

Sediment quality guidelines have been developed by a variety of agencies to classify and rank sites and to make decisions where more detailed studies are needed (Ingersoll et al. 2000). The U.S. EPA studied the severity of sediment contamination and identified watersheds where there was probable concern for sediment contamination (U.S. EPA 1997). To make this assessment, the U.S. EPA developed a series of screening values for 233 potential organic and metal sediment contaminants (U.S. EPA 1997). Based on available scientific studies, estimated sediment chemistry values were then developed for 111 sediment contaminants. In addition, values for estimated apparent effects threshold-low (AET-L) and apparent effects threshold-high (AET-H) were also included. These thresholds can be used to judge the degree of contamination of a sediment (Long

Table 13 U.S. EPA sediment screening values, AET-L, AET-H, and TACO Tier 1 soil remediation objectives for metals. All values are milligrams per kilogram.

	U.S. EPA[1] Estimated sediment screening value	U.S. EPA[1] AET-L	U.S. EPA[1] AET-H	TACO[2] Tier 1 soil ingestion
Sb	200			31
As	70	57	700	0.4[3]
Ba				5,500
Be				0.1
B				7,000
Cd	9.6	5	10	78
Cr	370	260	270	390
Co				4,700
Cu	270	390	1,300	2,900
Cyanide				1,600
Pb	218	450	600	400
Mn				3,700
Hg	0.71	0.6	2.1	23
Ni	52			1,600
Se				390
Ag	3.7	6	6	390
Tl				6
V				550
Zn	410	410	1,600	23,000

[1]National Sediment Quality Survey, screening values for chemicals (U.S. EPA 1997).

[2]Section 742 Tier 1 soil remediation objectives; exposure route-specific for soil ingestion.

[3]Listed value currently under review.

Table 14 U.S. EPA sediment screening values, AET-L, AET-H, and TACO Tier 1 soil remediation objectives for selected organic compounds. Values are milligrams per kilogram.

	U.S. EPA estimated sediment screening value	U.S. EPA AET-L	U.S. EPA AET-H	TACO Tier 1 soil ingestion
Acenaphthene	1.3	0.5	2	4,700
Acenaphthylene	0.6	1.3	1.3	
Anthracene	1.1	1.0	13	23,000
Benzo(a)anthracene	0.17	1.6	5.1	0.9
Benzo(a)pyrene	0.017	1.6	3.6	
Benzo(b)fluoranthene	0.17	3.6	9.9	0.9
Benzo(g,h,i)perylene	2.6	0.7	2.6	
Benzo(k)fluoranthene	1.7	3.6	9.9	9
Chrysene	2.8	2.8	9.2	88
Dibenz(a,h)anthracene	0.017	0.2	1.0	0.09
Fluoranthene	6.2	2.5	30	3,100
Fluorene	0.54	0.5	3.6	3,100
Indeno(1,2,3-c,d)pyrene	0.17	0.7	2.6	0.9
Naphthalene	0.47	2.1	2.7	3,100
Phenanthrene	1.8	1.5	6.9	
Pyrene	2.6	3.3	16	2,300
PCBs	0.0025	1	3.1	10
Aldrin	0.0012			0.04
Dieldrin	0.012			0.04
DDT	0.027	0.009	0.15	2
Chlordane	0.048			0.5
Endrin	0.042			23
Methoxychlor	0.019			390
α-BHC	0.001			0.1
γ-BHC	0.0037			0.5
Heptachlor	0.0044			0.1
Heptachlor epoxide	0.0022			0.07

Table 15 Consensus-based sediment quality guidelines for freshwater ecosystems and the number of sediment samples from Peoria Lake above the probable effect concentration based on Appendix 3 values from Laboratory A and Appendix 2 values from ISGS. All values are milligrams per kilogram.

	Consensus-based TEC[1]	Consensus-based PEC[1]	N > PEC Laboratory A Appendix 3	N > PEC ISGS Appendix 1	N > PEC ISGS Appendix 2
As	9.8	33	5/20	NM	0/20
Cd	1.0	5	8/20	2/20	11/20
Cr	43	111	0/20	NM	0/20
Cu	32	149	NM	0/20	0/20
Pb	36	128	0/20	1/20	0/20
Hg	0.18	1.06	0/20	NM	NM
Ni	23	49	NM	6/20	11/20
Zn	121	459	NM	1/20	1/20

[1]From MacDonald et al. (2000). TEC, threshold effect concentration; PEC, probable effect concentration; NM, not measured.

et al. 1995). The U. S. EPA used the screening criteria to evaluate 1,373 of the 2,111 watersheds in the United States. Contained in the report is the lower Illinois-Senachwine Lake watershed, which includes Big Bureau Creek, Crow Creek, Upper Peoria Lake, Senachwine Lake, and the Illinois River. A summary of the sediment chemistry data used to classify the Lower Illinois Senachwine Lake watershed by the U.S. EPA as an area of probable concern for sediment contamination is shown in table 12. The data sources used to evaluate the sediment chemistry of the watershed were from 21 stations in the STORET database. STORET (an acronym for "storage and retrieval") is a repository for the U.S. EPA's environmental data system for water quality, biological, and physical data.

It has been proposed that dredged sediment could be used to remediate contaminated industrial sites ("brownfields"). The concentrations of metals and organic compounds regulated at these locations are given in the TACO regulations (Illinois Statues 1997). TACO, an acronym for "tiered approach to corrective action objectives," is a tool for deciding the degree of remediation a contaminated site must undergo in order to protect human health.

Tables 13 and 14 list the U.S. EPA sediment chemistry screening values, the AET-L and AET-H (Long et al. 1995), and the TACO Tier 1 soil remediation objectives for metals and organic compounds.

Tables 15 and 16 list consensus-based sediment quality guidelines for freshwater ecosystems recently developed for the U.S. EPA (Ingersol et al. 2000, MacDonald et al. 2000). The tables also list the number of times the consensus-based probable effect concentration was exceeded by Peoria Lake sediment samples.

Table 16 Consensus-based sediment quality guidelines for freshwater ecosystems and the number of sediment samples from Peoria Lake above the consensus probable effect concentration based on Appendix 3 values from Laboratory A. All values are milligrams per kilogram.

	Consensus-based TEC[1]	Consensus-based PEC[1]	N > PEC Laboratory A Appendix 3[2]	N > PEC Laboratory A Appendix 3[3]
Anthracene	0.057	0.845	0/20	0/20
Benzo(a) anthracene	0.108	1.05	4/20	1/20
Benzo(a)pyrene	0.150	1.45	2/20	1/20
Chrysene	0.166	1.29	6/20	1/20
Dibenz(a,h)anthracene	0.033	NG		
Fluorene	0.077	0.54	0/20	0/20
Fluoranthene	0.423	2.23	1/20	0/20
Naphthalene	0.176	0.56	0/20	0/20
Phenanthrene	0.204	1.17	1/20	0/20
Pyrene	0.195	1.52	5/20	1/20
Total PAHs	1.61	22.8	2/20	0/20
Total PCBs	0.0025	0.676	0/20	
Dieldrin	0.002	0.062	0/20	
Total DDTs	0.005	0.57	0/20	
Chlordane	0.003	0.017	0/20	
Endrin	0.002	0.207	0/20	
γ-BHC	0.002	0.005	0/20	
Heptachlor epoxide	0.002	0.016	0/20	

[1]From MacDonald et al. (2000). TEC, Threshold effect concentration; NG, no guideline.
[2]EPA Method 8311 high pressure liquid chromatography.
[3]EPA Method 8270 gas chromatography-mass spectrometry.

Conclusions and Recommendations

Concentrations of metals in the sediments of Peoria Lake are, in general, above background values for Illinois soils and sometimes are in the elevated classification of sediments, as defined by the IEPA. Some metal concentrations exceed the U.S. EPA sediment chemistry screening values, but none approach the TACO values. Cadmium and nickel concentrations often are above the consensus-based probable effect concentration. The concentrations of some PAH compounds exceed U.S. EPA sediment chemistry screening values and approach the TACO values. Several PAH compounds exceed the consensus-based probable effect concentration in Peoria Lake sediments, but results are method dependent. Pesticides, volatile organic compounds, semi-volatile organic compounds, and chlorinated pesticides were usually not detected.

Research is needed to understand the fate and distribution of PAH compounds in the sediments of Peoria Lake.

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Appendix 1 Total metal concentrations in large composite sediment samples taken from vibracores collected in Peoria Lake in 1998, analyzed by ISGS.

Analysis no.	Core ID	Depth interval (cm)	Total C (%)	Inorganic C (%)	Organic C (%)	SiO_2 XRF[1] (%)	Al_2O_3 XRF (%)	Fe_2O_3 XRF (%)	CaO XRF (%)	MgO XRF (%)	K_2O XRF (%)	Na_2O XRF (%)
R21559	179	0–100	3.06	1.73	1.33	65.70	8.60	3.16	5.16	2.98	2.24	0.77
R21560	179	100–166	3.98	0.95	3.03	59.20	13.00	5.37	3.26	2.65	2.87	0.65
R21557	177	0–100	3.36	1.02	2.34	59.00	13.10	5.21	3.87	2.62	2.80	0.64
R21558	177	100–172	4.13	0.47	3.66	56.50	15.50	6.41	2.21	2.33	3.29	0.48
R21555	175	0–75	3.47	1.03	2.44	58.90	13.20	5.41	3.91	2.61	2.80	0.64
R21556	175	75–151	2.58	0.72	1.86	65.00	11.90	5.04	2.82	2.12	2.64	0.68
R21545	171 E	0–60	3.71	1.37	2.34	57.60	12.10	4.93	4.98	3.00	2.68	0.66
R21546	171 E	60–120	4.34	0.29	4.05	60.00	14.40	5.32	1.89	1.96	2.85	0.57
R21544	171 M	0–110	3.59	0.88	2.71	58.00	13.50	5.52	3.61	2.57	2.88	0.62
R21547	171 W	0–100	3.70	1.14	2.56	58.40	12.60	5.20	4.33	2.80	2.71	0.65
R21548	171 W	100–190	4.00	1.03	2.97	55.70	13.70	5.78	4.01	2.73	2.91	0.56
R21521	169	0–100	3.66	1.19	2.47	57.70	12.90	5.33	4.40	2.85	2.79	0.63
R21522	169	100–200	4.88	0.89	3.99	53.10	14.60	6.22	4.14	2.47	3.03	0.47
R21543	165.5	0–94	3.36	1.19	2.17	59.40	12.10	5.06	4.59	2.82	2.82	0.66
R21549	164 E	0–100	3.91	1.24	2.67	53.60	14.10	5.94	5.08	2.78	2.94	0.50
R21550	16 E	100–170	9.20	3.32	5.88	38.80	9.70	4.33	15.32	2.57	2.10	0.36
R21551	164 E	170–228	6.88	4.02	2.86	46.30	7.40	2.68	14.67	4.17	1.93	0.57
R21552	164 W	0–100	3.74	1.19	2.55	55.00	14.20	6.02	4.46	2.88	3.02	0.54
R21553	164 W	100–175	3.83	1.28	2.55	55.70	13.50	5.61	4.62	3.03	2.90	0.56
R21554	164 W	175–254	3.94	1.23	2.71	56.70	13.30	5.49	4.62	2.87	2.83	0.58

Analysis no.	Core ID	Depth interval (cm)	TiO_2 XRF (%)	P_2O_5 XRF (%)	MnO XRF (%)	SO_3 XRF (%)	Ba XRF (ppm)	Ba EDX (ppm)	Cd AAS (ppm)	Cu AAS (ppm)	Mo EDX (ppm)	Ni AAS (ppm)
R21559	179	0–100	0.49	0.26	0.07	0.28	428	489	<0.9	38	23	<20
R21560	179	100–166	0.69	0.33	0.08	0.36	495	557	<0.9	53	25	24
R21557	177	0–100	0.71	0.34	0.08	0.39	521	591	2.8	58	15	37
R21558	177	100–172	0.73	0.28	0.07	0.35	528	586	<0.9	54	12	27
R21555	175	0–75	0.72	0.39	0.09	0.41	504	583	<0.9	70	18	<20
R21556	175	75–151	0.63	0.22	0.08	0.32	465	540	<0.9	51	24	<20
R21545	171 E	0–60	0.69	0.39	0.10	0.39	490	543	1.6	51	22	<20
R21546	171 E	60–120	0.69	0.22	0.05	0.27	562	609	<0.9	43	14	<20
R21544	171 M	0–110	0.72	0.41	0.09	0.41	501	597	3.9	65	22	91
R21547	171 W	0–100	0.71	0.46	0.09	0.40	530	564	3.5	77	18	42
R21548	171 W	100–190	0.73	0.59	0.10	0.42	543	592	9.6	92	20	96
R21521	169	0–100	0.70	0.48	0.10	0.39	480	582	4.7	71	29	56
R21522	169	100–200	0.71	0.31	0.09	0.51	538	586	1.8	57	20	49
R21543	165.5	0–94	0.67	0.24	0.10	0.34	470	547	<0.9	36	25	<20
R21549	164 E	0–100	0.70	0.38	0.10	0.52	486	571	1.8	59	20	73
R21550	164 E	100–170	0.49	0.20	0.08	0.77	375	527	<0.9	30	17	<20
R21551	164 E	170–228	0.43	0.11	0.06	0.41	336	320	<0.9	19	17	<20
R21552	164 W	0–100	0.71	0.46	0.12	0.42	496	583	3.6	63	15	58
R21553	164 W	100–175	0.71	0.54	0.10	0.39	528	584	5.5	76	18	67
R21554	164 W	175–254	0.70	0.35	0.09	0.40	493	562	1.8	59	23	43

continued

Appendix 1 *(continued)* Total metal concentrations in large composite sediment samples taken from vibracores collected in Peoria Lake in 1998, analyzed by ISGS.

Analysis no.	Core ID	Depth interval (cm)	Pb AAS (ppm)	Sn EDX (ppm)	Sr XRF (ppm)	Sr EDX	Zn AAS (ppm)	Zr XRF (ppm)	Zr EDX (ppm)
R21559	179	0–100	116	<5	120	92	180	210	260
R21560	179	100–166	117	9	110	88	332	150	227
R21557	177	0–100	95	7	121	104	334	146	240
R21558	177	100–172	72	7	105	88	284	93	180
R21555	175	0–75	108	8	129	105	410	148	242
R21556	175	75–151	62	7	109	90	237	141	221
R21545	171 E	0–60	180	7	129	112	301	176	264
R21546	171 E	60–120		6	113	98	168	121	208
R21544	171 M	0–110	109	8	119	103	373	139	229
R21547	171 W	0–100	93	8	133	117	399	147	244
R21548	171 W	100–190	116	9	132	112	591	111	198
R21521	169	0–100	101	7	132	109	395	138	225
R21522	169	100–200	93	6	120	96	322	93	170
R21543	165.5	0–94	73	<5	127	103	176	162	250
R21549	164 E	0–100	73	7	120	105	355	101	192
R21550	164 E	100–170	60	<5	159	127	129	67	128
R21551	164 E	170–228	49	<5	149	132	51	133	213
R21552	164 W	0–100	101	5	120	105	372	105	190
R21553	164 W	100–175	122	9	136	113	462	120	209
R21554	164 W	175–254	73	6	134	104	324	131	209

[1]XRF, x-ray fluorescence; EDX, energy dispersion x-ray; AAS, atomic absorption spectrometry.

Appendix 2 Total recoverable metal concentrations in large composite sediment samples taken from vibracores collected in Peoria Lake in 1998, analyzed by ISGS.

Analysis no.	Core ID	Depth interval (cm)	Si (ppm)	Al (%)	Fe (%)	Ca (%)	Mg (%)	K (ppm)	Na (ppm)	Ti (ppm)	Mn (ppm)	S (ppm)
R21559	179	0–100	266	1.72	2.04	3.47	1.69	0.37	270	336	472	818
R21560	179	100–166	150	3.51	3.55	2.19	1.44	0.73	410	366	573	1,100
R21557	177	0–100	218	3.92	4.18	2.64	1.44	0.81	460	476	617	1,410
R21558	177	100–172	225	4.58	2.04	1.46	1.19	0.97	400	464	512	818
R21555	175	0–75	290	3.46	3.61	2.71	1.42	0.64	490	468	704	1,390
R21556	175	75–151	297	3.32	3.43	1.90	1.22	0.68	320	381	584	909
R21545	171 E	0–60	205	3.41	3.30	3.44	1.67	0.74	420	433	730	1,300
R21546	171 E	60–120	244	3.90	3.47	1.24	0.98	0.63	270	263	339	970
R21544	171 M	0–110	157	3.75	3.66	2.45	1.37	0.76	560	395	647	1,290
R21547	171 W	0–100	213	3.65	3.45	2.94	1.52	0.77	560	469	696	1,390
R21548	171 W	100–190	234	3.68	3.75	2.69	1.43	0.73	770	394	775	1,640
R21521	169	0–100	202	4.18	4.28	3.01	1.31	0.82	580	392	580	1,870
R21522	169	100–200	163	4.17	4.21	2.96	1.30	0.85	460	388	460	1,860
R21543	166	0–94	191	3.43	3.46	3.14	1.56	0.74	210	451	721	1,050
R21549	164 E	0–100	158	4.06	3.91	3.47	1.49	0.87	490	465	734	1,900
R21550	164 E	100–170	166	2.93	2.88	10.90	1.41	0.68	210	321	584	3,200
R21551	164 E	170–228	205	1.17	1.66	10.60	2.43	0.27	160	188	455	1,420
R21552	164 W	0–100	140	4.10	3.96	3.04	1.54	0.84	480	455	884	1,490
R21553	164 W	100–175	167	3.86	3.71	3.16	1.66	0.81	590	483	784	1,410
R21554	164 W	175–254	361	3.76	3.59	3.11	1.56	0.78	510	444	706	1,290

continued

Appendix 2 *(continued)* Total recoverable metal concentrations in large composite sediment samples taken from vibracores collected in Peoria Lake in 1998, analyzed by ISGS.

Analysis no.	Core ID	Depth interval (cm)	As (ppm)	B (ppm)	Be (ppm)	Ba (ppm)	Cd (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)	La (ppm)	Li (ppm)
R21559	179	0–100	<50	52	0.62	113	<5	8	31	29	19	16
R21560	179	100–166	<50	32	1.13	194	<5	14	42	46	25	35
R21557	177	0–100	<50	60	1.17	227	6	13	62	52	27	37
R21558	177	100–172	<50	68	1.36	237	<5	17	49	43	27	45
R21555	175	0–75	<50	48	1.13	206	7	15	68	61	25	33
R21556	175	75–151	<50	50	1.15	202	<5	13	45	43	24	33
R21545	171 E	0–60	<50	59	1.13	196	6	14	61	48	25	34
R21546	171 E	60–120	<50	48	1.35	275	<5	12	39	33	24	37
R21544	171 M	0–110	<50	57	1.26	221	7	15	72	57	26	39
R21547	171 W	0–100	<50	58	1.16	225	7	15	78	69	25	35
R21548	171 W	100–190	<50	56	1.38	241	13	16	105	86	27	39
R21521	169	0–100	<50	58	1.69	243	9	19	73	51	27	44
R21522	169	100–200	<50	58	1.57	242	8	18	83	49	27	44
R21543	166	0–94	<50	62	1.13	190	<5	14	43	31	26	38
R21549	164 E	0–100	<50	63	1.39	229	6	16	65	52	26	43
R21550	164 E	100–170	<50	59	1.11	201	<5	13	26	22	18	32
R21551	164 E	170–228	<50	38	0.53	97	<5	7	11	13	14	17
R21552	164 W	0–100	<50	63	1.39	232	6	16	70	50	26	43
R21553	164 W	100–175	<50	64	1.39	238	8	15	92	70	26	39
R21554	164 W	175–254	<50	59	1.15	208	<5	14	58	56	25	38

Analysis no.	Core ID	Depth interval (cm)	Mo (ppm)	Ni (ppm)	Pb (ppm)	Sb (ppm)	Sc (ppm)	Se (ppm)	Sr (ppm)	Ti (ppm)	V (ppm)	Zn (ppm)
R21559	179	0–100	<10	27	43	28	4	<50	38	<100	21	192
R21560	179	100–166	<10	33	50	<25	7	<50	40	<100	36	333
R21557	177	0–100	<10	50	48	<25	7	<50	53	<100	51	335
R21558	177	100–172	<10	40	38	<25	9	<50	43	<100	21	279
R21555	175	0–75	<10	51	77	<25	7	<50	51	<100	35	403
R21556	175	75–151	<10	32	40	<25	7	<50	41	<100	31	230
R21545	171 E	0–60	<10	64	59	<25	7	<50	60	<100	35	297
R21546	171 E	60–120	<10	39		<25	8	<50	42	<100	43	166
R21544	171 M	0–110	<10	48	52	<25	7	<50	55	<100	37	369
R21547	171 W	0–100	<10	69	67	<25	7	<50	65	<100	38	396
R21548	171 W	100–190	<10	87	88	<25	7	<50	65	<100	34	571
R21521	169	0–100	<10	199	58	<25	9	<50	59	<100	42	335
R21522	169	100–200	<10	148	55	<25	8	<50	59	<100	41	331
R21543	166	0–94	<10	48	25	<25	7	<50	53	<100	35	173
R21549	164 E	0–100	<10	62	61	28	8	<50	62	<100	43	344
R21550	164 E	100–170	<10	30	<25	<25	6	<50	114	<100	32	130
R21551	164 E	170–228	<10	17	<25	<25	3	<50	87	<100	12	49
R21552	164 W	0–100	<10	65	57	<25	8	<50	59	<100	41	365
R21553	164 W	100–175	<10	81	77	<25	8	<50	70	<100	40	454
R21554	164 W	175–254	<10	54	43	<25	7	<50	66	<100	36	319

Appendix 3 Results from comprehensive analysis of large composite sediment samples taken from vibracores collected in Peoria Lake in 1998, analyzed by Laboratory A.

Analysis no	Core ID	Depth interval (cm)	Sand (%)	Silt (%)	Clay (%)	Median size (mm)	Moisture (%)	Bulk density (g/cm^3)	COD (mg/L)	As (mg/kg)	Ba (mg/kg)	Ca (mg/kg)	Cr (mg/kg)
R21559	179	0–100	44	37	19	0.080	37	1.7	130	<8	81	2.2	33.1
R21560	179	100–166	1	36	63	0.003	41	1.6	85	<9	136	2.2	28
R21557	177	0–100	1	50	49	0.005	51	1.4	130	13	126	3.9	44.7
R21558	177	100–172	2	26	72	0.002	48	1.6	31	22	172	4.6	68
R21555	175	0–75	1	45	54	0.004	48	1.6	53	43	157	5.8	68
R21556	175	75–151	12	32	56	0.004	44	1.6	97	15	157	2.5	50..5
R21545	171 E	0–60	NA	NA	NA	NA	52	1.4	130	32	133	5.4	56.9
R21546	171 E	60–120	16	33	51	0.005	46	1.7	447	24	211	1.5	27.8
R21544	171 M	0–110	2	35	63	0.002	51	1.5	165	26	144	5.7	60.1
R21547	171 W	0–100	1	46	53	0.005	53	1.4	599	30	154	7.6	77.1
R21548	171 W	100–190	1	41	58	0.004	47	1.4	177	34	178	11.6	99
R21521	169	0–100	1	46	53	0.004	56	1.4	85	26	129	5.1	51.9
R21522	169	100–200	4	36	60	0.003	56	1.4	388	29	173	2.0	34
R21543	165.5	0–94	6	41	53	0.004	48	1.6	713	26	106	1.7	31.8
R21549	164 E	0–100	1	34	65	0.002	58	1.4	153	34	137	3.9	55.3
R21550	164 E	100–170	10	42	48	0.005	61	1.4	599	29	143	<1.3	20
R21551	164 E	170–228	11	56	33	0.010	38	1.6	290	12	87	<0.8	9.4
R21552	164 W	0–100	1	31	68	0.002	49	1.6	264	39	163	5.2	63.1
R21553	164 W	100–175	1	42	57	0.004	50	1.5	226	37	170	7.4	85.5
R21554	164 W	175–254	1	43	56	0.004	56	1.4	74	32	141	3.6	52.6

Analysis no.	Core ID	Depth interval (cm)	Pb (mg/kg)	Ag (mg/kg)	Hg (mg/kg)	Se (mg/kg)	NH_4 (mg/kg)	TKN (mg/kg)	Cyanide (mg/kg)	P (mg/kg)	Reactive sulfide (mg/kg)
R21559	179	0–100	50.1	<1.6	0.37	1.3	78	2,020	<0.79	1,280	97
R21560	179	100–166	45.6	<1.7	0.48	2.1	104	2,260	<0.85	716	97
R21557	177	0–100	47.4	<2.0	0.45	1.9	82	1,840	<1.0	870	178
R21558	177	100–172	99.2	<1.9	0.72	2.0	89	2,200	<0.96	1,210	118
R21555	175	0–75	77.0	2	0.52	2.0	71	604	<0.96	951	97
R21556	175	75–151	70.2	<1.8	0.45	1.9	77	1,670	<0.89	867	97
R21545	171 E	0–60	58.8	<2.0	0.34	1.6	51	218	<1.0	1,660	81
R21546	171 E	60–120	25.6	<1.8	0.06	1.7	108	399	<0.92	834	40
R21544	171 M	0–110	61.8	<2.0	0.33	1.5	63	541	<1.0	1,130	122
R21547	171 W	0–100	73.6	<2.1	0.38	1.1	105	367	<1.0	1,380	60
R21548	171 W	100–190	94.8	<1.9	0.52	1.0	128	139	<0.84	1,040	60
R21521	169	0–100	55.8	<2.3	0.25	1.2	98	700	<1.1	1,430	97
R21522	169	100–200	32.5	<2.2	0.27	1.9	140	3,020	<1.1	889	118
R21543	165.5	0–94	33.4	<1.9	0.12	<1.0	30	533	<0.95	937	81
R21549	164 E	0–100	55.8	<2.4	0.24	<1.2	81	117	<1.2	574	40
R21550	164 E	100–170	20.4	<2.6	0.09	<1.3	134	790	<1.3	870	101
R21551	164 E	170–228	<7.9	<1.6	<0.032	0.9	45	179	<0.79	690	40
R21552	164 W	0–100	71.9	<1.9	0.38	1.1	151	1,970	<0.97	865	45
R21553	164 W	100–175	80.7	<2.0	0.36	1.0	142	1,320	<0.99	852	86
R21554	164 W	175–254	55.2	<2.2	0.42	<1.1	98	1,880	<1.1	1,020	45

continued

Appendix 3 *(continued)* Results from comprehensive analysis of large composite sediment samples taken from vibracores collected in Peoria Lake in 1998, analyzed by Laboratory A.

Analysis no.	Core ID	Depth interval (cm)	Acetone (μg/kg)	Benzene (μg/kg)	Bromodichloro methane (μg/kg)	Bromoform (μg/kg)	2-Butanone (μg/kg)	Carbon disulfide (μg/kg)	Carbon tetrachloride (μg/kg)
R21559	179	0–100	47	<7.9	<7.9	<7.9	<16	<7.9	<7.9
R21560	179	100–166	220	<8.5	<8.5	<8.5	37	<8.5	<8.5
R21557	177	0–100	26	<10	<10	<10	<20	<10	<10
R21558	177	100–172	180	<9.6	<9.6	<9.6	<19	<9.6	<9.6
R21555	175	0–75	170	<9.6	<9.6	<9.6	31	<9.6	<9.6
R21556	175	75–151	320	<8.9	<8.9	<8.9	21	<8.9	<8.9
R21545	171 E	0–60	165	<10	<10	<10	28	<10	<10
R21546	171 E	60–120	255	<9.2	<9.2	<9.2	54	<9.2	<9.2
R21544	171 M	0–110	225	<10	<10	<10	42	<10	<10
R21547	171 W	0–100	230	<11	<11	<11	38	<11	<11
R21548	171 W	100–190	320	<9.4	<9.4	<9.4	57	<9.4	<9.4
R21521	169	0–100	110	<11	<11	<11	<23	<11	<11
R21522	169	100–200	360	<11	<11	<11	47	<11	<11
R21543	165.5	0–94	500	<9.6	<9.6	<9.6	71	<9.6	<9.6
R21549	164 E	0–100	230	<12	<12	<12	39	<12	<12
R21550	164 E	100–170	550	<13	<13	<13	150	<13	<13
R21551	164 E	170–228	280	<8.1	<8.1	<8.1	100	<8.1	<8.1
R21552	164 W	0–100	220	<9.8	<9.8	<9.8	71	<9.8	<9.8
R21553	164 W	100–175	200	<10	<10	<10	32	<10	<10
R21554	164 W	175–254	160	<23	<23	<23	<45	<23	<23

Analysis no.	Core ID	Depth interval (cm)	Chloro-benzene (μg/kg)	Chloro-ethane (μg/kg)	Chloro-form (μg/kg)	Dibromochloro-methane (μg/kg)	1,1-Dichloro-ethane (μg/kg)	1,2-Dichloro-ethane (μg/kg)
R21559	179	0–100	<7.9	<16	<7.9	<7.9	<7.9	<7.9
R21560	179	100–166	<8.5	<17	<8.5	<8.5	<8.5	<8.5
R21557	177	0–100	<10	<20	<10	<10	<10	<10
R21558	177	100–172	<9.6	<19	<9.6	<9.6	<9.6	<9.6
R21555	175	0–75	<9.6	<19	<9.6	<9.6	<9.6	<9.6
R21556	175	75–151	<8.9	<18	<8.9	<8.9	<8.9	<8.9
R21545	171 E	0–60	<10	<21	<10	<10	<10	<10
R21546	171 E	60–120	<9.2	<18	<9.2	<9.2	<9.2	<9.2
R21544	171 M	0–110	<10	<20	<10	<10	<10	<10
R21547	171 W	0–100	<11	<21	<11	<11	<11	<11
R21548	171 W	100–190	<9.4	<19	<9.4	<9.4	<9.4	<9.4
R21521	169	0–100	<11	<23	<11	<11	<11	<11
R21522	169	100–200	<11	<23	<11	<11	<11	<11
R21543	165.5	0–94	<9.6	<19	<9.6	<9.6	<9.6	<9.6
R21549	164 E	0–100	<12	<24	<12	<12	<12	<12
R21550	164 E	100–170	<13	<26	<13	<13	<13	<13
R21551	164 E	170–228	<8.1	<16	<8.1	<8.1	<8.1	<8.1
R21552	164 W	0–100	<9.8	<20	<9.8	<9.8	<9.8	<9.8
R21553	164 W	100–175	<10	<20	<10	<10	<10	<10
R21554	164 W	175–254	<23	<45	<23	<23	<23	<23

continued

Appendix 3 *(continued)* Results from comprehensive analysis of large composite sediment samples taken from vibracores collected in Peoria Lake in 1998, analyzed by Laboratory A.

Analysis no.	Core ID	Depth interval (cm)	1,1-Dichloro-ethene (μg/kg)	*cis*-1,2-Dichloro-ethene (μg/kg)	*trans*-1,2-Dichloro-ethene (μg/kg)	1,2-Dichloro-propane (μg/kg)	*cis*-1,3-Dichloro-propene (μg/kg)	*trans*-1,3-Dichloro-propene (μg/kg)
R21559	179	0–100	<7.9	<16	<7.9	<7.9	<7.9	<7.9
R21560	179	100–166	<8.5	<17	<8.5	<8.5	<8.5	<8.5
R21557	177	0–100	<10	<20	<10	<10	<10	<10
R21558	177	100–172	<9.6	<19	<9.6	<9.6	<9.6	<9.6
R21555	175	0–75	<9.6	<19	<9.6	<9.6	<9.6	<9.6
R21556	175	75–151	<8.9	<18	<8.9	<8.9	<8.9	<8.9
R21545	171 E	0–60	<10	<21	<10	<10	<10	<10
R21546	171 E	60–120	<9.2	<18	<9.2	<9.2	<9.2	<9.2
R21544	171 M	0–110	<10	<20	<10	<10	<10	<10
R21547	171 W	0–100	<11	<21	<11	<11	<11	<11
R21548	171 W	100–190	<9.4	<19	<9.4	<9.4	<9.4	<9.4
R21521	169	0–100	<11	<23	<11	<11	<11	<11
R21522	169	100–200	<11	<23	<11	<11	<11	<11
R21543	165.5	0–94	<9.6	<19	<9.6	<9.6	<9.6	<9.6
R21549	164 E	0–100	<12	<24	<12	<12	<12	<12
R21550	164 E	100–170	<13	<26	<13	<13	<13	<13
R21551	164 E	170–228	<8.1	<16	<8.1	<8.1	<8.1	<8.1
R21552	164 W	0–100	<9.8	<20	<9.8	<9.8	<9.8	<9.8
R21553	164 W	100–175	<10	<20	<10	<10	<10	<10
R21554	164 W	175–254	<23	<45	<23	<23	<23	<23

Analysis no.	Core ID	Depth interval (cm)	Ethyl benzene (μg/kg)	2-Hexanone (μg/kg)	Methyl chloride (chloromethane) (μg/kg)	Methyl bromide (bromoethane) (μg/kg)	4-Methyl-2-pentanone (μg/kg)	Methylene chloride (μg/kg)	Styrene (μg/kg)
R21559	179	0–100	<7.9	<16	<16	<16	<16	<7.9	<7.9
R21560	179	100–166	<8.5	<17	<17	<17	<17	82	<8.5
R21557	177	0–100	<10	<20	<20	<20	<20	<10	<10
R21558	177	100–172	<9.6	<19	<19	<19	<19	82	<9.6
R21555	175	0–75	<9.6	<19	<19	<19	<19	<9.6	<9.6
R21556	175	75–151	<8.9	<18	<18	<18	<18	480	<8.9
R21545	171 E	0–60	<10	<21	<21	<21	<21	<10	<10
R21546	171 E	60–120	<9.2	<18	<18	<18	<18	<9.2	<9.2
R21544	171 M	0–110	<10	<20	<20	<20	<20	<10	<10
R21547	171 W	0–100	<11	<21	<21	<21	<21	<11	<11
R21548	171 W	100–190	<9.4	<19	<19	<19	<19	<9.4	<9.4
R21521	169	0–100	<11	<23	<23	<23	<23	<11	<11
R21522	169	100–200	<11	<23	<23	<23	<23	100	<11
R21543	165.5	0–94	<9.6	<19	<19	<19	<19	<19	<9.6
R21549	164 E	0–100	<12	<24	<24	<24	<24	<12	<12
R21550	164 E	100–170	<13	<26	<26	<26	<26	15	<13
R21551	164 E	170–228	<8.1	<16	<16	<16	<16	9	<8.1
R21552	164 W	0–100	<9.8	<20	<20	<20	<20	<9.8	<9.8
R21553	164 W	100–175	<10	<20	<20	<20	<20	<10	<10
R21554	164 W	175–254	<23	<45	<45	<45	<45	<23	<23

contined

Appendix 3 ***(continued)*** Results from comprehensive analysis of large composite sediment samples taken from vibracores collected in Lake Peoria in 1998, analyzed by Laboratory A.

Analysis no.	Core ID	Depth interval (cm)	1,1,2,2-Tetra-chloroethane (μg/kg)	Tetrachloro-ethene (μg/kg)	Toluene (μg/kg)	1,1,1,1-Trichloro-ethane (μg/kg)	1,1,2-Trichloro-ethane (μg/kg)	Trichloro-ethene (μg/kg)	Vinyl chloride (μg/kg)
R21559	179	0–100	<7.9	<7.9	<7.9	<7.9	<7.9	<7.9	<16
R21560	179	100–166	<8.5	<8.5	<8.5	<8.5	<8.5	<8.5	<17
R21557	177	0–100	<10	<10	<10	<10	<10	<10	<20
R21558	177	100–172	<9.6	<9.6	<9.6	<9.6	<9.6	<9.6	<19
R21555	175	0–75	<9.6	<9.6	<9.6	<9.6	<9.6	<9.6	<19
R21556	175	75–151	<8.9	<8.9	<8.9	<8.9	<8.9	<8.9	<18
R21545	171 E	0–60	<10	<10	<10	<10	<10	<10	<21
R21546	171 E	60–120	<9.2	<9.2	<9.2	<9.2	<9.2	<9.2	<18
R21544	171 M	0–110	<10	<10	<10	<10	<10	<10	<20
R21547	171 W	0–100	<11	<11	<11	<11	<11	<11	<21
R21548	171 W	100–190	<9.4	<9.4	<9.4	<9.4	<9.4	<9.4	<19
R21521	169	0–100	<11	<11	<11	<11	<11	<11	<23
R21522	169	100–200	<11	<11	<11	<11	<11	<11	<23
R21543	165.5	0–94	<9.6	<9.6	<9.6	<9.6	<9.6	<9.6	<19
R21549	164 E	0–100	<12	<12	<12	<12	<12	<12	<24
R21550	164 E	100–170	<13	<13	<13	<13	<13	<13	<26
R21551	164 E	170–228	<8.1	<8.1	<8.1	<8.1	<8.1	<8.1	<16
R21552	164 W	0–100	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8	<20
R21553	164 W	100–175	<10	<10	<10	<10	<10	<10	<20
R21554	164 W	175–254	<23	<23	<23	<23	<23	<23	<45

Analysis no.	Core ID	Depth interval (cm)	Total xylenes (μg/kg)	Aroclor 1016 (μg/kg)	Aroclor 1221 (μg/kg)	Aroclor 1232 (μg/kg)	Aroclor 1242 (μg/kg)	Aroclor 1248 (μg/kg)	Aroclor 1254 (μg/kg)	Aroclor 1260 (μg/kg)	Aldrin (μg/kg)	γ-BHC (lindane) (μg/kg)
R21559	179	0–100	<7.9	<52	<52	<52	<52	<52	<52	<52	<63	<63
R21560	179	100–166	<8.5	<55	<55	<55	<55	<55	<55	<55	<67	<67
R21557	177	0–100	<10	<67	<67	<67	<67	<67	<67	<67	<81	<81
R21558	177	100–172	<9.6	<63	<63	<63	<63	<63	<63	<63	<77	<77
R21555	175	0–75	<9.6	<63	<63	<63	<63	<63	<63	<63	<77	<77
R21556	175	75–151	<8.9	<59	<59	<59	<59	<59	<59	<59	<71	<71
R21545	171 E	0–60	<10	<680	<680	<680	<680	<680	<680	<680	<83	<83
R21546	171 E	60–120	<9.2	<610	<610	<610	<610	<610	<610	<610	<74	<74
R21544	171 M	0–110	<10	<670	<670	<670	<670	<670	<670	<670	<81	<81
R21547	171 W	0–100	<11	<700	<700	<700	<700	<700	<700	<700	<84	<84
R21548	171 W	100–190	<9.4	<620	<620	<620	<620	<620	<620	<620	<75	<75
R21521	169	0–100	<11	<75	<75	<75	<75	<75	<75	<75	<18	<18
R21522	169	100–200	<11	<76	<76	<76	<76	<76	<76	<76	<18	<18
R21543	165.5	0–94	<9.6	<630	<630	<630	<630	<630	<630	<630	<76	<76
R21549	164 E	0–100	<12	<790	<790	<790	<790	<790	<790	<790	<95	<95
R21550	164 E	100–170	<13	<840	<840	<840	<840	<840	<840	<840	<100	<100
R21551	164 E	170–228	<8.1	<530	<530	<530	<530	<530	<530	<530	<64	<64
R21552	164 W	0–100	<9.8	<640	<640	<640	<640	<640	<640	<640	<78	<78
R21553	164 W	100–175	<10	<660	<660	<660	<660	<660	<660	<660	<80	<80
R21554	164 W	175–254	<23	<750	<750	<750	<750	<750	<750	<750	<90	<90

continued

Appendix 3 *(continued)* Results from comprehensive analysis of large composite sediment samples taken from vibracores collected in Lake Peoria in 1998, analyzed by Laboratory A.

Analysis no.	Core ID	Depth interval (cm)	α-BHC (μg/kg)	β-BHC (μg/kg)	δ-BHC (μg/kg)	Chlordane (α) (μg/kg)	Chlordane (γ) (μg/kg)	4,4′-DDD (μg/kg)	4,4′-DDE (μg/kg)	4,4′-DDT (μg/kg)	Dieldrin (μg/kg)
R21559	179	0–100	<63	<63	<63	<63	<63	<130	<130	<130	<130
R21560	179	100–166	<67	<67	<67	<67	<67	<130	<130	<130	<130
R21557	177	0–100	<81	<81	<81	<81	<81	<160	<160	<160	<160
R21558	177	100–172	<77	<77	<77	<77	<77	<150	<150	<150	<150
R21555	175	0–75	<77	<77	<77	<77	<77	<150	<150	<150	<150
R21556	175	75–151	<71	<71	<71	<71	<71	<140	<140	<140	<140
R21545	171E	0–60	<83	<83	<83	<83	<83	<160	<160	<160	<160
R21546	171E	60–120	<74	<74	<74	<74	<74	<150	<150	<150	<150
R21544	171M	0–110	<81	<81	<81	<81	<81	<160	<160	<160	<160
R21547	171W	0–100	<84	<84	<84	<84	<84	<170	<170	<170	<170
R21548	171W	100–190	<75	<75	<75	<75	<75	<150	<150	<150	<150
R21521	169	0–100	<18	<18	<18	<18	<18	<36	<36	<36	<36
R21522	169	100–200	<18	<18	<18	<18	<18	<36	<36	<36	<36
R21543	165.5	0–94	<76	<76	<76	<76	<76	<150	<150	<150	<150
R21549	164 E	0–100	<95	<95	<95	<95	<95	<190	<190	<190	<190
R21550	164 E	100–170	<100	<100	<100	<100	<100	<200	<200	<200	<200
R21551	164 E	170–228	<64	<64	<64	<64	<64	<130	<130	<130	<130
R21552	164 W	0–100	<78	<78	<78	<78	<78	<160	<160	<160	<160
R21553	164 W	100–175	<80	<80	<80	<80	<80	<160	<160	<160	<160
R21554	164 W	175–254	<90	<90	<90	<90	<90	<180	<180	<180	<180

Analysis no.	Core ID	Depth interval (cm)	Endo-sulfan I (μg/kg)	Endo-sulfan II (μg/kg)	Endosulfan sulfate (μg/kg)	Endrin (μg/kg)	Endrin aldehyde (μg/kg)	Endrin ketone (μg/kg)	Heptachlor (μg/kg)	Heptachlor epoxide (μg/kg)	Metho-xychlor (μg/kg)
R21559	179	0–100	<63	<63	<130	<130	<130	<130	<63	<63	<270
R21560	179	100–166	<67	<67	<130	<130	<130	<130	<67	<67	<280
R21557	177	0–100	<81	<81	<160	<160	<160	<160	<81	<81	<350
R21558	177	100–172	<77	<77	<150	<150	<150	<150	<77	<77	<320
R21555	175	0–75	<77	<77	<150	<150	<150	<150	<77	<77	<330
R21556	175	75–151	<71	<71	<140	<140	<140	<140	<71	<71	<300
R21545	171 E	0–60	<83	<83	<160	<160	<160	<160	<83	<83	<350
R21546	171 E	60–120	<74	<74	<150	<150	<150	<150	<74	<74	<310
R21544	171 M	0–110	<81	<81	<160	<160	<160	<160	<81	<81	<340
R21547	171 W	0–100	<84	<84	<170	<170	<170	<170	<84	<84	<360
R21548	171 W	100–190	<75	<75	<150	<150	<150	<150	<75	<75	<320
R21521	169	0–100	<18	<18	<36	<36	<36	<36	<18	<18	<77
R21522	169	100–200	<18	<18	<36	<36	<36	<36	<18	<18	<77
R21543	165.5	0–94	<76	<76	<150	<150	<150	<150	<76	<76	<320
R21549	164 E	0–100	<95	<95	<190	<190	<190	<190	<95	<95	<400
R21550	164 E	100–170	<100	<100	<200	<200	<200	<200	<100	<100	<430
R21551	164 E	170–228	<64	<64	<130	<130	<130	<130	<64	<64	<270
R21552	164 W	0–100	<78	<78	<160	<160	<160	<160	<78	<78	<330
R21553	164 W	100–175	<80	<80	<160	<160	<160	<160	<80	<80	<340
R21554	164 W	175–254	<90	<90	<180	<180	<180	<180	<90	<90	<380

continue

Appendix 3 *(continued)* Results from comprehensive analysis of large composite sediment samples taken from vibracores collected in Lake Peoria in 1998, analyzed by Laboratory A.

Analysis no.	Core ID	Depth interval (cm)	Toxaphene (μg/kg)	2,4-D (μg/kg)	2,4-DB (μg/kg)	Dalapon (μg/kg)	Dicamba (μg/kg)	Dichloroprop (μg/kg)	Dinoseb (μg/kg)	MCPA (μg/kg)	MCPP (μg/kg)	Pentachlorophenol (μg/kg)
R21559	179	0–100	<1,300	<160	<160	<160	<79	<160	<1,600	<32,000	<32,000	<16
R21560	179	100–166	<1,300	<170	<170	<170	<85	<170	<1,700	<34,000	<34,000	<17
R21557	177	0–100	<1,600	<200	<200	<200	<100	<200	<2,000	<40,000	<40,000	<20
R21558	177	100–172	<1,500	190	<190	3,100	<96	<190	<1,900	<38,000	<38,000	<19
R21555	175	0–75	<1,500	<190	<190	<190	<96	<190	<1,900	<38,000	<38,000	<19
R21556	175	75–151	<1,400	220	<180	<180	<88	<180	<1,800	<35,000	<35,000	<18
R21545	171 E	0–60	<1,600	<210	<210	<210	<100	<210	<2,100	<41,000	<41,000	<21
R21546	171 E	60–120	<1,500	<180	<180	<180	<92	<180	<1,800	<37,000	<37,000	<18
R21544	171 M	0–110	<1,600	<200	<200	<200	<100	<200	<1,900	<38,000	<38,000	<19
R21547	171 W	0–100	<1,700	<210	<210	<210	<110	<210	<2,100	<42,000	<42,000	<21
R21548	171 W	100–190	<1,500	<210	<190	<190	<94	<190	<1,900	<38,000	<38,000	<19
R21521	169	0–100	<360	<220	<220	3,800	<110	<220	<2,200	<45,000	<45,000	<22
R21522	169	100–200	<360	1,300	<230	2,700	280	<230	<2,300	<45,000	<45,000	<23
R21543	165.5	0–94	<1,500	<190	<190	<190	<96	<190	<1,900	<38,000	<38,000	<19
R21549	164 E	0–100	<1,900	570	<240	4,100	<120	<240	<2,400	<47,000	<47,000	<24
R21550	164 E	100–170	<2,000	<160	<260	<260	<130	<260	<2,600	<51,000	<51,000	<26
R21551	164 E	170–228	<1,300	<160	<160	<160	<80	<160	<1,600	<32,000	<32,000	<16
R21552	164 W	0–100	<1,600	<200	<200	9,175	<100	<200	<2,000	<39,000	<39,000	<20
R21553	164 W	100–175	<1,600	<200	<200	<200	<100	<200	<2,000	<40,000	<40,000	<20
R21554	164 W	175–254	<1,800	<220	<220	<220	<100	<220	<2,200	<45,000	<45,000	<22

Analysis no.	Core ID	Depth interval (cm)	Picloram (μg/kg)	2,4,5-T (μg/kg)	2,4,5-TP (Silvex) (μg/kg)	PAH by EPA Method 8311 HPLC Acenaph-thene (μg/kg)	Acenaph-thylene (μg/kg)	Anthracene (μg/kg)	Benzo(a) anthracene (μg/kg)	Benzo(a) pyrene (μg/kg)
R21559	179	0–100	<160	<79	<79	<52	<52	270	2,300	2,200
R21560	179	100–166	<170	<85	<85	1,300	<56	420	3,100	2,200
R21557	177	0–100	<200	<100	<100	1,800	<67	170	<100	700
R21558	177	100–172	<190	<96	<96	1,000	<63	270	1,400	1,000
R21555	175	0–75	<190	<96	<96	1,100	<63	190	1,200	890
R21556	175	75–151	<180	<88	<88	<880	<59	160	740	730
R21545	171 E	0–60	<210	<100	<100	<1,000	<1,000	<100	<100	450
R21546	171 E	60–120	<180	<92	<92	<61	<61	<91	<91	<91
R21544	171 M	0–110	<190	<96	<96	<1,000	<1,000	<100	<100	490
R21547	171 W	0–100	<210	<110	<110	1,900	<1,000	110	<100	620
R21548	171 W	100–190	<190	<94	<94	1,000	<930	170	140	790
R21521	169	0–100	<220	<110	<110	3,500	<74	130	290	640
R21522	169	100–200	<230	<110	<110	1,200	<75	110	180	300
R21543	165.5	0–B94	<190	<96	<96	<940	<940	<94	310	240
R21549	164 E	0–100	<240	<120	<120	<1,200	<1,200	<120	<120	420
R21550	164 E	100–170	<260	<130	<130	<84	<1,300	<130	<8.4	<130
R21551	164 E	170–228	<160	<80	<80	<53	<53	<79	<5.3	<79
R21552	164 W	0–100	<200	<98	<98	<65	<65	<97	110	240
R21553	164 W	100–175	<200	<100	<100	1,400	<65	<98	<98	380
R21554	164 W	175–254	<220	<110	<110	2,000	<74	<110	<110	390

continue

Appendix 3 *(continued)* Results from comprehensive analysis of large composite sediment samples taken from vibracores collected in Lake Peoria in 1998, analyzed by Laboratory A.

Analysis no.	Core ID	Depth interval (cm)	Benzo(b) fluoranthene (μg/kg)	Benzo(g,h,i) perylene (μg/kg)	Benzo(k) fluoranthene (μg/kg)	Chrysene (μg/kg)	Dibenz(a,h) anthracene (μg/kg)	Fluoranthene (μg/kg)	Fluorene (μg/kg)	Indeno 1,2,3-cd pyrene (μg/kg)
R21559	179	0–100	3,700	1,500	680	3,500	2,800	2,100	<780	1,200
R21560	179	100–166	3,400	1,200	690	2,700	2,000	3,800	<840	1,000
R21557	177	0–100	5,800	140	280	1,300	<6.7	650	<1,000	1,100
R21558	177	100–172	3,100	120	360	2,000	<94	1,900	<940	1,200
R21555	175	0–75	3,600	460	320	1,600	1,300	1,600	<950	430
R21556	175	75–151	2,500	120	270	1,700	<88	1,400	<880	970
R21545	171 E	0–60	3,300	<6.9	170	230	<6.9	440	<1,000	<100
R21546	171 E	60–120	740	<91	<91	<6.1	<91	<6.1	<61	<6.1
R21544	171 M	0–110	3,200	<100	250	280	<6.7	550	<1,000	<100
R21547	171 W	0–100	3,400	<100	300	280	1,000	640	<1,000	480
R21548	171 W	100–190	2,400	<6.2	390	630	<6.2	930	<930	500
R21521	169	0–100	4,700	680	240	990	980	850	<1,100	<7.4
R21522	169	100–200	3,800	370	120	460	340	690	<75	280
R21543	165.5	0–94	3,100	<6.3	130	120	<94	360	<940	<94
R21549	164 E	0–100	4,600	<120	220	230	<120	520	<1,200	150
R21550	164 E	100–170	1,600	<130	<130	<130	150	150	<84	<8.4
R21551	164 E	170–228	260	<79	<79	<79	<5.3	<5.3	<53	<5.3
R21552	164 W	0–100	2,800	<97	130	130	<6.5	210	<65	250
R21553	164 W	100–175	2,200	100	150	340	<98	520	<980	330
R21554	164 W	175–254	3,000	<7.4	180	<7.4	<7.4	560	<1,100	500

Analysis no.	Core ID	Depth interval (cm)	Naphthalene (μg/kg)	Phenanthrene (μg/kg)	Pyrene (μg/kg)	PAH by EPA Method 8270 GC/MS Acenaphthene (μg/kg)	Acenaphthylene (μg/kg)	Anthracene (μg/kg)	Benzo(a) anthracene (μg/kg)	Benzo(a) pyrene (μg/kg)
R21559	179	0–100	<780	650	2,900	<260	270	<260	930	1,300
R21560	179	100–166	<840	1,400	3,500	<280	<280	440	1,200	1,700
R21557	177	0–100	<1,000	260	<100	<340	<340	<340	410	540
R21558	177	100–172	<940	600	2,300	<320	<320	<320	640	790
R21555	175	0–75	<950	550	2,000	<320	<320	<320	640	630
R21556	175	75–151	<880	270	1,600	<290	<290	<290	950	990
R21545	171 E	0–60	<69	160	<100	<340	<340	<340	<340	410
R21546	171 E	60–120	<61	<91	<91	<300	<300	<300	<300	<300
R21544	171 M	0–110	<67	170	810	<340	<340	<340	<340	<340
R21547	171 W	0–100	<70	250	<100	<350	<350	<350	370	550
R21548	171 W	100–190	<62	400	<93	<310	<310	<310	460	670
R21521	169	0–100	<1,100	310	1,200	<370	<370	<370	<370	1,000
R21522	169	100–200	<1,100	160	830	<370	<370	<370	<370	1,200
R21543	165.5	0–94	<63	120	<94	<320	<320	<320	<320	<320
R21549	164 E	0–100	<78	170	780	<390	<390	<390	<390	<390
R21550	164 E	100–170	<84	<130	<130	<420	<420	<420	<420	500
R21551	164 E	170–228	<53	<79	<5.3	<260	<260	<260	<260	<260
R21552	164 W	0–100	<970	140	420	<320	<320	<320	<320	<320
R21553	164 W	100–175	<980	180	730	<330	<330	<330	<330	400
R21554	164 W	175–254	<1,100	200	800	<370	<370	<370	<370	<370

continue

Appendix 3 *(continued)* Results from comprehensive analysis of large composite sediment samples taken from vibracores collected in Lake Peoria in 1998, analyzed by Laboratory A.

Analysis no.	Core ID	Depth interval (cm)	Benzo(b) fluoran-thene (μg/kg)	Benzo(g,h,i) Perylene (μg/kg)	Benzo(k) fluoran-thene (μg/kg)	Chrysene (μg/kg)	Dibenz(a,h) anthracene (μg/kg)	Fluoran-thene (μg/kg)	Fluorene (μg/kg)	Indeno (1,2,3-cd) pyrene (μg/kg)
R21559	179	0–100	1,300	380	480	1,200	<260	880	<260	350
R21560	179	100–166	1,200	550	1,200	1,400	<280	1,600	<280	500
R21557	177	0–100	610	<340	<340	580	<340	600	<340	<340
R21558	177	100–172	710	<320	520	820	<320	1,100	<320	<320
R21555	175	0–75	690	<320	480	900	<320	970	<320	<320
R21556	175	75–151	890	<290	550	1,200	<290	1,300	<290	<290
R21545	171 E	0–60	460	<340	<340	410	<340	360	<340	<340
R21546	171 E	60–120	<300	<300	<300	<300	<300	<300	<300	<300
R21544	171 M	0–110	<340	<340	<340	<340	<340	<340	<340	<340
R21547	171 W	0–100	650	<350	580	520	<350	500	<350	<350
R21548	171 W	100–190	760	<310	540	650	<310	560	<310	<310
R21521	169	0–100	<370	<370	<370	<370	<370	<370	<370	<370
R21522	169	100–200	<370	<370	<370	<370	<370	<370	<370	<370
R21543	165.5	0–94	<320	<320	<320	<320	<320	<320	<320	<320
R21549	164 E	0–100	<390	<390	<390	<390	<390	<390	<390	<390
R21550	164 E	100–170	690	<420	590	570	<420	540	<420	<420
R21551	164 E	170–228	<260	<260	<260	<260	<260	<260	<260	<260
R21552	164 W	0–100	360	<320	330	360	<320	330	<320	<320
R21553	164 W	100–175	480	<330	410	470	<330	410	<330	<330
R21554	164 W	175–254	<370	<370	<370	390	<370	<370	<370	<370

continued

Analysis no.	Core ID	Depth interval (cm)	Naphthalene (μg/kg)	Phenanthrene (μg/kg)	Pyrene (μg/kg)
R21559	179	0–100	<260	290	1,100
R21560	179	100–166	<280	900	2,100
R21557	177	0–100	<340	<340	750
R21558	177	100–172	<320	<320	1,100
R21555	175	0–75	<320	<320	1,200
R21556	175	75–151	<290	<290	1,400
R21545	171 E	0–60	<340	<340	560
R21546	171 E	60–120	<300	<300	<300
R21544	171 M	0–110	<340	<340	410
R21547	171 W	0–100	<350	<350	770
R21548	171 W	100–190	<310	320	790
R21521	169	0–100	<370	<370	<370
R21522	169	100–200	<370	<370	<370
R21543	165.5	0–94	<320	<320	<320
R21549	164 E	0–100	<390	<390	<390
R21550	164 E	100–170	<420	<420	720
R21551	164 E	170–228	<260	<260	<260
R21552	164 W	0–100	<320	<320	430
R21553	164 W	100–175	<330	<330	610
R21554	164 W	175–254	<370	<370	460

Appendix 4 Results from comprehensive analysis of sediment samples collected in Peoria Lake near RM 165 Spindler Marina, 2/10/1999, analyzed by Laboratory A.

Sample ID Distance from shore	A 175 m	B 450 m	C 725 m
Moisture (%)	56	52	57
Total solids-soil (%)	43.4	47	40.8
Volatile solid (%)	0.91	1.5	1.2
Total organic compound (TOC) (%)	0.064	0.069	0.065
Bulk density (g/cm^3)	1.4	1.2	1.3
Chemical oxygen demand (COD) (mg/L)	18.7	18.7	7.5
PH	7.6	8	8
Inorganic parameters			
As (mg/kg)	8	7.9	7.3
Ba (mg/kg)	126	134	125
Cd (mg/kg)	4.7	4.9	3.5
Cr (mg/kg)	49.6	56.3	38.5
Pb (mg/kg)	54.9	59.8	42.9
Ag (mg/kg)	<2	<2	<2
Hg (mg/kg)	0.25	0.3	0.43
Se (mg/kg)	<1	<1	<1
NH_4 N (mg/kg)	322	516	894
TKN (mg/kg)	387	590	866
Cyanide (mg/kg)	<1	<1	<1
Reactive sulfide (mg/kg)	<10	<10	38
Volatile organic compounds			
Acetone (μg/kg)	57	63	56
Benzene (μg/kg)	<11	<10	<12
Bromodichloromethane (μg/kg)	<11	<10	<12
Bromoform (μg/kg)	<11	<10	<12
2-Butanone (μg/kg)	<23	<21	<23
Carbon disulfide (μg/kg)	<11	<10	<12
Carbon tetrachloride (μg/kg)	<11	<10	<12
Chlorobenzene (μg/kg)	<11	<10	<12
Chloroethane (μg/kg)	<23	<21	<23
Chloroform (μg/kg)	<11	<10	<12
Dibromochloromethane (μg/kg)	<11	<10	<12

Sample ID Distance from shore	A 175 m	B 450 m	C 725 m
1,1-Dichloroethane (µg/kg)	<11	<10	<12
1,2-Dichloroethane (µg/kg)	<11	<10	<12
1,1-Dichloroethene (µg/kg)	<11	<10	<12
cis-1,2-Dichloroethene (µg/kg)	<11	<10	<12
trans-1,2-Dichloroethene (µg/kg)	<11	<10	<12
1,2-Dichloropropane (µg/kg)	<11	<10	<12
cis-1,3-Dichloropropene (µg/kg)	<11	<10	<12
trans-1,3-Dichloropropene (µg/kg)	<11	<10	<12
Ethyl benzene (µg/kg)	<11	<10	<12
2-Hexanone (µg/kg)	<23	<21	<23
Methyl chloride (µg/kg)	<23	<21	<23
Methyl bromide (µg/kg)	<23	<21	<23
4-Methyl-2-pentanone (µg/kg)	<23	<21	<23
Methylene chloride (µg/kg)	<11	<10	<12
Styrene (µg/kg)	<11	<10	<12
1,1,2,2-Tetrachloroethane (µg/kg)	<11	<10	<12
Tetrachloroethene (µg/kg)	<11	<10	<12
Toluene (µg/kg)	<11	<10	<12
1,1,1-Trichloroethane (µg/kg)	<11	<10	<12
1,1,2-Trichloroethane (µg/kg)	<11	<10	<12
Trichloroethene (µg/kg)	<11	<10	<12
Vinyl chloride (µg/kg)	<23	<21	<23
Total xylenes (µg/kg)	<11	<10	<12
PCBs			
Aroclor-1016 (µg/kg)	<74	<68	<76
Aroclor-1221(µg/kg)	<74	<68	<76
Aroclor-1232 (µg/kg)	<74	<68	<76
Aroclor-1242 (µg/kg)	<74	<68	<76
Aroclor-1248 (µg/kg)	<74	<68	<76
Aroclor-1254 (µg/kg)	<74	<68	<76
Aroclor-1260 (µg/kg)	<74	<68	<76

continued

Appendix 4 ***(continued)*** Results from comprehensive analysis of sediment samples collected in Peoria Lake near RM 165 Spindler Marina, 2/10/1992, analyzed by Laboratory A.

Sample ID Distance from shore	A 175 m	B 450 m	C 725 m
Pesticides			
Aldrin (µg/kg)	<90	<83	<93
Gamma-BHC (µg/kg)	<90	<83	<93
α-BHC (µg/kg)	<90	<83	<93
β-BHC (µg/kg)	<90	<83	<93
δ-BHC (µg/kg)	<90	<83	<93
Chlordane (α) (µg/kg)	<90	<83	<93
Chlordane (γ) (µg/kg)	<90	<83	<93
4,4'-DDD (µg/kg)	<180	<160	<180
4,4'-DDE (µg/kg)	<180	<160	<180
4,4'-DDT (µg/kg)	<180	<160	<180
Dieldrin (µg/kg)	<180	<160	<160
Endosulfan I (µg/kg)	<90	<83	<93
Endosulfan II (µg/kg)	<90	<83	<93
Endosulfan sulfate (µg/kg)	<180	<160	<180
Endrin (µg/kg)	<180	<160	<180
Endrin aldehyde (µg/kg)	<180	<160	<180
Endrin ketone (µg/kg)	<180	<160	<180
Heptachlor (µg/kg)	<90	<83	<93
Heptachlor epoxide (µg/kg)	<90	<83	<93
Methoxychlor (µg/kg)	<380	<350	<390
Toxaphene (µg/kg)	<1,800	<1,600	<1,800
Chlorinated pesticides			
2,4-D (µg/kg)	<230	<210	<230
2,4-DB (µg/kg)	<230	<210	<230
Dalapon (µg/kg)	<230	<210	<230
Dicamba (µg/kg)	<110	<100	<120
Dichloroprop (µg/kg)	<230	<210	<230
Dinoseb (µg/kg)	<2,300	<2,100	<2,300
MCPA (µg/kg)	<45,000	<42,000	<46,000
MCPP (µg/kg)	140,000	120,000	<46,000
Pentachlorophenol (µg/kg)	<23	<21	<23
Picloram (µg/kg)	<230	<210	<230

Sample ID Distancc from shore	A 175 m	B 450 m	C 725 m
2,4,5-T (µg/kg)	<110	<100	<120
2,4,5-TP (Silvex) (µg/kg)	<110	<100	<120
PAH 8310			
Acenaphthenc (µg/kg)	500	660	110
Acenaphthylcne (µg/kg)	<75	<68	<76
Anthracene (µg/kg)	47	60	<76
Benzo(a)anthracene (µg/kg)	160	230	<76
Benzo(a)pyrene (µg/kg)	310	460	<76
Benzo(b)fluoranthcne (µg/kg)	2,300	1,800	<76
Benzo(g,h,i)perylene (µg/kg)	260	1,100	<76
Benzo(k)fluoranthene (µg/kg)	180	240	<76
Chrysene (µg/kg)	200	300	<76
Dibenz(a,h)anthracene (µg/kg)	2,800	2,800	<76
Fluoranthene (µg/kg)	350	300	<76
Fluorene (µg/kg)	<75	93	<76
Indeno(1,2,3-cd) pyrene (µg/kg)	560	700	320
Naphthalene (µg/kg)	320	210	240
Phenanthrene (µg/kg)	160	230	<76
Pyrene (µg/kg)	560	480	<76
PAH SW8270			
Accnaphthene (µg/kg)	<370	<340	<380
Acenaphthylene (µg/kg)	<370	<340	<380
Anthracene (µg/kg)	<370	<340	<380
Benzo(a)anthracene (µg/kg)	<370	<340	<380
Benzo(a)pyrene (µg/kg)	<370	<340	<380
Benzo(b)fluoranthene (µg/kg)	<370	<340	<380
Benzo(g,h,i)perylene (µg/kg)	<370	<340	<380
Benzo(k)fluoranthcnc (µg/kg	<370	370	<380
Chryscne (µg/kg)	<370	<340	<380
Dibenz(a,h)anthracene (µg/kg)	<370	<340	<380
Fluoranthene (µg/kg)	<370	<340	<380
Fluorene (µg/kg)	<370	<340	<380

continued

Appendix 4 ***(continued)*** Results from comprehensive analysis of sediment samples collected in Peoria Lake near RM 165 Spindler Marina, 2/10/1992, analyzed by Laboratory A.

Sample ID Distance from shore	A 175 m	B 450 m	C 725 m
Indeno(1,2,3-cd) pyrene (µg/kg)	<370	<340	<380
Naphthalene (µg/kg)	<370	<340	<380
Phenanthrene (µg/kg)	<370	<340	<380
Pyrene (µg/kg)	<370	450	<380

Appendix 5 Results from comprehensive analysis of five sediment samples collected in Peoria Lake near RM 165, 10/11/2000, analyzed by Laboratory B.

Sample ID	PL 200, depth 20–30 cm	PL 210, depth 25–35 cm	PL 202, depth 25–35 cm	PL 203, depth 37–47 cm	PL 204, depth 47–57 cm
Al (%)	1.00	1.31	1.30	0.89	0.85
Fe (%)	1.63	1.85	1.87	1.49	1.40
Ca (%)	2.06	1.85	2.07	2.60	2.12
Mg (%)	0.81	0.90	1.05	1.35	1.08
K (%)	0.14	0.17	0.17	0.13	0.13
Na (mg/kg)	167	322	316	257	238
Mn (mg/kg)	405	438	479	406	368
Ag (mg/kg)	<1.9	<1.9	<1.9	<1.9	<1.9
As (mg/kg)	5.8	5.8	6.6	5.48	4
Be (mg/kg)	0	0	0	0	0
Ba (mg/kg)	81	96.1	91.4	74.2	68.6
Cd (mg/kg)	<1.9	<1.9	<1.9	<1.9	<1.9
Co (mg/kg)	6.7	7.7	7.77	6.5	5.93
Cr (mg/kg)	29.6	39.1	33.5	30.3	26.7
Cu (mg/kg)	28.5	32.7	29.7	21.7	20.8
Hg (mg/kg)	0.19	0	0	0	0
Mo (mg/kg)	<4	<4	<4	<4	<4
Ni (mg/kg)	25.8	36.4	32.8	27.2	25.6
Pb (mg/kg)	45.2	62.5	58.4	45.5	48
Sb (mg/kg)	<10	<10	<10	<10	<10
Se (mg/kg)	<1	<1	<1	<1	<1
Tl (mg/kg)	<1	<1	<1	<1	<1
V (mg/kg)	17.6	21.1	21.2	17.4	16.4
Zn (mg/kg)	160	184	159	133	120
Ammonia N (mg/kg)	412	394	235	393	239
TKN (mg/kg)	1,090	4,060	2,250	3,010	2,700
Total cyanide (mg/kg)	<2	<2	<1.9	<1.7	<1.6
Total P (mg/kg)	947	1,100	1,200	904	794
pH	7.3	7.4	7.1	7.4	7.6
Total organic carbon (mg/kg)	430	4,600	310	670	1,100
Moisture (%)	48.5	51.8	50.3	44.2	37.8

continued

Appendix 5 ***(continued)*** Results from comprehensive analysis of sediment samples collected in Peoria Lake near RM 165, 10/11/2000, analyzed by Laboratory B.

Sample ID	PL 200, depth 20–30 cm	PL 210, depth 25–35 cm	PL 202, depth 25–35 cm	PL 203, depth 37–47 cm	PL 204, depth 47–57 cm
PCBs					
Aroclor-1016 (μg/kg)	<64	<68	<66	<59	<53
Aroclor-1221 (μg/kg)	<64	<68	<66	<59	<53
Aroclor-1232 (μg/kg)	<64	<68	<66	<59	<53
Aroclor-1242 (μg/kg)	<64	<68	<66	<59	<53
Aroclor-1248 (μg/kg)	<64	<68	<66	<59	<53
Aroclor-1254 (μg/kg)	<64	<68	<66	<59	<53
Aroclor-1260 (μg/kg)	<64	<68	<66	<59	<53
Volatile organic compounds					
Acetone (μg/kg)	<25	<25	<25	<25	<25
Benzene (μg/kg)	<10	<10	<10	<10	<10
Bromodichloromethane (μg/kg)	<10	<10	<10	<10	<10
Bromoform (μg/kg)	<10	<10	<10	<10	<10
2-Butanone (μg/kg)	<19	<19	<19	<19	<19
Carbon disulfide (μg/kg)	<19	<19	<19	<19	<19
Carbon tetrachloride (μg/kg)	<10	<10	<10	<10	<10
Chlorobenzene (μg/kg)	<10	<10	<10	<10	<10
Chloroethane (μg/kg)	<10	<10	<10	<10	<10
Chloroform (μg/kg)	<10	<10	<10	<10	<10
Dibromochloromethane (μg/kg)	<10	<10	<10	<10	<10
1,1-Dichloroethane (μg/kg)	<10	<10	<10	<10	<10
1,1-Dichloroethene (μg/kg)	<10	<10	<10	<10	<10
cis-1,2-Dichloroethene (μg/kg)	<10	<10	<10	<10	<10
trans-1,2-Dichloroethene (μg/kg)	<10	<10	<10	<10	<10
1,2-Dichloropropane (μg/kg)	<10	<10	<10	<10	<10
cis-1,3-Dichloropropene (μg/kg)	<10	<10	<10	<10	<10
trans-1,3-Dichloropropene (μg/kg)	<10	<10	<10	<10	<10
Ethyl benzene (μg/kg)	<10	<10	<10	<10	<10
2-Hexanone (μg/kg)	<25	<25	<25	<25	<25
Methyl chloride (μg/kg)	<10	<10	<10	<10	<10
4-Methyl-2-pentanone (μg/kg)	<19	<19	<19	<19	<19

	PL 200, depth 20–30 cm	PL 210, depth 25–35 cm	PL 202, depth 25–35 cm	PL 203, depth 37–47 cm	PL 204, depth 47–57 cm
Methylene chloride (µg/kg)	<10	<10	<10	<10	<10
Styrene (µg/kg)	<10	<10	<10	<10	<10
1,1,2,2-Tetrachloroethane (µg/kg)	<10	<10	<10	<10	<10
Tetrachloroethene (µg/kg)	<10	<10	<10	<10	<10
Toluene (µg/kg)	<10	<10	<10	<10	<10
1,1,2-Trichloroethane (µg/kg)	<10	<10	<10	<10	<10
Trichloroethene (µg/kg)	<10	<10	<10	<10	<10
Vinyl chloride (µg/kg)	<4	<4	<4	<4	<4
Total xylenes (µg/kg)	<10	<10	<10	<10	<10
GC/MS semi-volatiles					
Phenol (µg/kg)	<640	<680	<660	<590	<530
bis-(2-Chloroethyl)ether (µg/kg)	<640	<680	<660	<590	<530
2-Chlorophenol (µg/kg)	<640	<680	<660	<590	<530
1,3-Dichlorobenzene (µg/kg)	<640	<680	<660	<590	<530
1,4-Dichlorobenzene (µg/kg)	<640	<680	<660	<590	<530
Benzyl alcohol (µg/kg)	<1,300	<1,400	<1,300	<1,200	<1,100
1,2-Dichlorobenzene (µg/kg)	<640	<680	660	<590	<530
2-Methylphenol (µg/kg)	<640	<680	660	590	<530
bis-(2-Chloroisopropyl)ether (µg/kg)	<640	<680	660	590	<530
3&4-Methylphenol (µg/kg)	<1,300	1,400	1,300	1,200	<1,100
N-Nitroso-di-n-propylamine (µg/kg)	<640	680	660	590	<530
Hexachloroethane (µg/kg)	<640	680	660	590	<530
Nitrobenzene (µg/kg)	<640	680	660	590	<530
Isophorone (µg/kg)	<640	680	660	590	<530
2-Nitrophenol (µg/kg)	<640	680	660	590	<530
2,4-Dimethylphenol (µg/kg)	<640	680	660	590	<530
Benzoic acid (µg/kg)	<3,100	3,300	3,200	2,900	<2,600
bis-(2-Chloroethoxy) methane (µg/kg)	<640	680	660	590	<530
2,4-Dichlorophenol (µg/kg)	<640	680	660	590	<530
1,2,4-Trichlorobenzene (µg/kg)	<640	680	660	590	<530
4-Chloroaniline (µg/kg)	<1,300	1,400	1,300	1,200	<1,100

continued

Appendix 5 ***(continued)*** Results from comprehensive analysis of sediment samples collected in Peoria Lake near RM 165, 10/11/2000, analyzed by Laboratory B.

Sample ID	PL 200, depth 20–30 cm	PL 210, depth 25–35 cm	PL 202, depth 25–35 cm	PL 203, depth 37–47 cm	PL 204, depth 47–57cm
Hexachlorobutadiene (μg/kg)	<640	680	660	590	<530
4-Chloro-3-methylphenol (μg/kg)	<1,300	1,400	1,300	1,200	<1,100
Hexachlorocyclopentadiene (μg/kg)	<640	680	660	590	<530
2,4,6-Trichlorophenol (μg/kg)	<640	680	660	590	<530
2,4,5-Trichlorophenol (μg/kg)	<640	680	660	590	<530
2-Chloronaphthalene (μg/kg)	<640	680	660	590	<530
2-Nitroaniline (μg/kg)	<3,100	3,300	3,200	2,900	<2,600
Dimethylphthalate (μg/kg)	<640	680	660	590	<530
2,6-Dinitrotoluene (μg/kg)	<640	680	660	590	<530
3-Nitroaniline (μg/kg)	<3,100	3,300	3,200	2,900	<2,600
2,4-Dinitrophenol (μg/kg)	<3,100	3,300	3,200	2,900	<2,600
4-Nitrophenol (μg/kg)	<3,100	3,300	3,200	2,900	<2,600
Dibenzofuran (μg/kg)	<640	680	660	590	530
2,4-Dinitrotoluene (μg/kg)	<640	680	660	590	530
Diethylphthalate (μg/kg)	<640	680	660	590	530
4-Chlorophenyl-phenylether (μg/kg)	<640	680	660	590	530
4-Nitroaniline (μg/kg)	<3,100	3,300	3,200	2,900	2,600
4,6-Dinitro-2-methylphenol (μg/kg)	<3,100	3,300	3,200	2,900	2,600
N-Nitrosodiphenylamine (μg/kg)	<640	680	660	590	530
4-Bromophenyl-phenylether (μg/kg)	<640	680	660	590	530
Hexachlorobenzene (μg/kg)	<640	680	660	590	530
Pentachlorophenol (μg/kg)	<3,100	3,300	3,200	2,900	2,600
Di-n-butylphthalate (μg/kg)	<640	680	660	590	530
Butylbenzylphthalate (μg/kg)	<640	680	660	590	530
3,3′-Dichlorobenzidine (μg/kg)	<1,300	1,400	1,300	1,200	1,100
bis-(2-Ethylhexyl)phthalate (μg/kg)	<640	680	660	590	530
Di-n-octylphthalate (μg/kg)	<640	680	660	590	530
PAHs by 8310					
Acenaphthene (μg/kg)	76	47	<22	30	<18
Acenaphthylene (μg/kg)	<170	<180	<180	<160	<140
Anthracene (μg/kg)	10	<9	<9	<8	<7

	PL 200, depth 20–30 cm	PL 210, depth 25–35 cm	PL 202, depth 25–35 cm	PL 203, depth 37–47 cm	PL 204, depth 47–57 cm
Benzo(a)anthracene (μg/kg)	<70	<75	<72	<7	<6
Benzo(a)pyrene (μg/kg)	34	37	18	<3	11
Benzo(b)fluoranthene (μg/kg)	18	20	11	<3	<3
Benzo(g,h,i)perylene (μg/kg)	<5	63	29	<4	18
Benzo(k)fluoranthene (μg/kg)	<2	24	<22	<2	<2
Chrysene (μg/kg)	30	27	10	5	<2
Dibenz(a,h)anthracene (μg/kg)	<1	5	8	5	<1
Fluoranthene (μg/kg)	52	45	22	<8	14
Fluorene (μg/kg)	<25	<27	<26	<23	<21
Indeno(1,2,3-c,d) pyrene (μg/kg)	<2	34	14	<2	9
Naphthalene (μg/kg)	<210	<230	<220	<200	<180
Phenanthrene (μg/kg)	15	12	<5	5	<4
Pyrene (μg/kg)	<230	<250	30	<220	22
Pesticides					
Aldrin (μg/kg)	<1.7	<1.7	<1.7	<1.7	<1.7
α-BHC (μg/kg)	<1.7	<1.7	<1.7	<1.7	<1.7
β-BHC (μg/kg)	<1.7	<1.7	<1.7	<1.7	<1.7
γ-BHC (μg/kg)	<1.7	<1.7	<1.7	<1.7	<1.7
δ-BHC (μg/kg)	<1.7	<1.7	<1.7	<1.7	<1.7
Chlordane (μg/kg)	<17	<17	<17	<17	<17
Chlordane (α) (μg/kg)	<1.7	<1.7	<1.7	<1.7	<1.7
Chlordane (γ) (μg/kg)	<1.7	<1.7	<1.7	<1.7	<1.7
Chlorobenzilate (μg/kg)	<33	<33	<33	<33	<33
4,4′-DDD (μg/kg)	<3.3	<3.3	<3.3	<3.3	<3.3
4,4′-DDE (μg/kg)	<3.3	<3.3	<3.3	4.2	9.3
4,4′-DDT (μg/kg)	<3.3	<3.3	<3.3	<3.3	<3.3
Diallate (μg/kg)	<33	<33	<33	<33	<33
Dieldrin (μg/kg)	<3.3	<3.3	<3.3	<3.3	<3.3
Endosulfan I (μg/kg)	<1.7	<1.7	<1.7	<1.7	<1.7
Endosulfan II (μg/kg)	<3.3	<3.3	<3.3	<3.3	<3.3
Endosulfan sulfate (μg/kg)	<3.3	<3.3	<3.3	<3.3	<3.3

continued

Appendix 5 ***(continued)*** Results from comprehensive analysis of sediment samples collected in Peoria Lake near RM 165, 10/11/2000, analyzed by Laboratory B.

	PL 200, depth 20–30 cm	PL 210, depth 25–35 cm	PL 202, depth 25–35 cm	PL 203, depth 37–47 cm	PL 204, depth 47–57cm
Endrin (µg/kg)	<3.3	<3.3	<3.3	<3.3	<3.3
Endrin aldehyde (µg/kg)	<3.3	<3.3	<3.3	<3.3	<3.3
Endrin ketone (µg/kg)	<3.3	<3.3	<3.3	<3.3	<3.3
Heptachlor (µg/kg)	<1.7	<1.7	<1.7	<1.7	<1.7
Heptachlor epoxide (µg/kg)	<1.7	<1.7	<1.7	<1.7	<1.7
Isodrin (µg/kg)	<3.3	<3.3	<3.3	<3.3	<3.3
Methoxychlor (µg/kg)	<17	<17	<17	<17	<17
Toxaphene (µg/kg)	<79	<79	<79	<79	<79
Chlorinated herbicides					
Dicamba (µg/kg)	<10	<10	<10	<10	<10
2,4-D (µg/kg)	<40	<40	<40	<40	<40
2,4,5-TP Silvex (µg/kg)	<10	<10	<10	<10	<10
2,4,5-T (µg/kg)	<10	<10	<10	<10	<10
2,4 DB (µg/kg)	<100	<100	<100	<100	<100
Dalapon (µg/kg)	<200	<200	<200	<200	<200
MCPP (µg/kg)	<5,000	<5,000	<5,000	<5,000	<5,000
MCPA (µg/kg)	<5,000	<5,000	<5,000	<5,000	<5,000
Dichloroprop (µg/kg)	<40	<40	<40	<40	<40
Dinoseb (µg/kg)	<40	<40	<40	<40	<40